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ABSTRACT

The determinants and labor market consequences for immigrants of proficiency in speaking the dominant language (English in the United States and English of French in Canada) are explored, with focus on adult men using self-reported data from the 1980 and 1981 censuses of the United States and Canada, respectively. It is shown that the determinants of earnings among immigrants are remarkably similar in the two countries. Fluency in the dominant language has a large positive effect on earnings, independent of other personal characteristics and country of origin. The study shows the importance of explicitly incorporating dominant language fluency, and the determinants of dominant language fluency, in the criteria for allocating immigrant visas, if immigrant economic success is a policy objective. It also indicates that, because of the questions asked and the coding procedures, the data related to language in the U.S. census are superior to the data from the Canadian census for both statistical and public policy analysis. (Author/LB)

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LANGUAGE IN THE LABOR MARKET: THE IMMIGRANT EXPERIENCE IN CANADA AND THE UNITED STATES[#]

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Abstract

Language in the Labor Market: The Immigrant Experience in Canada and the United States

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This paper explores the determinants and labor market consequences for immigrants of proficiency in speaking the dominate language (English in the US, English or French in Canada). The statistical analysis is for adult men using the self-reported data, including data on language skills, available in the 1980 and 1981 censuses of the US and Canada, respectively.

Fluency in the dominant language in the two countries is shown to vary systematically with the immigrant's skills, demographic characteristics, country of origin and economic incentives. That is, fluency is greater the younger the age at immigration, the greater the pre-immigration exposure to the dominant language, the longer the duration in the destination, the higher the level of schooling, and if the person immigrated unmarried, currently has children, and lives in an area where few speak his native (non-dominant) language, among other variables. It is also shown that those who can expect to receive greater economic rewards from a higher level of language proficiency are more likely to make the investment and become more proficient.

The determinants of earnings among immigrants are shown to be remarkably similar in the two countries; it is as if there is one earnings determination process. Fluency in the dominant language has a large positive effect on earnings, independent of other personal characteristics and country of origin.

The study shows the importance of explicitly incorporating dominate language fluency, and the determinates of dominant language fluency, in the criteria for allocating immigrant visas, if immigrant economic success is a policy objective. Canadian immigration policy has made more progress in this regards than U.S. policy. Furthermore, this study shows that, because of the questions asked and the coding procedures, the data related to language in the U.S. census are superior to the data available in the Canadian census for both statistical and public policy analysis.

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I. INTRODUCTION

Spoken language skill, the ability to communicate verbally, is the most basic form of human capital. It is the first type of human capital to be acquired among children, and usually the last to be lost by the aged. Spoken language skills are acquired primarily in the home as infants learn to imitate older children and adults. The initial learning by imitating is quickly followed by a learning by doing.

Spoken language skills are so basic that they are usually taken for granted. Yet it is clear that the ability to communicate verbally through a common language must have substantial economic value. Economic transactions can take place without verbal communication, but the cost of these transactions is sharply increased, and their frequency sharply decreased, when this communication cannot occur.[1]

International immigrants are perhaps the group most acutely sensitive to the importance of language capital. Moving to a country where a different language is spoken results in a depreciation of the value of this catalyst for economic and social interaction. The decision to migrate, the choice of destination, and the success of their adjustment in the destination all depend, in part, on language skills.

Two key questions are addressed in this study. First, what are the determinants of the extent to which immigrants not fluent in the dominant language acquire dominant language skills? The adjustment process may vary systematically with the immigrant's economic, human capital and demographic characteristics. Second, what is the impact of dominant language fluency on labor market outcomes, such as earnings? It is easily shown that economic theory predicts that, ceteris paribus, those less fluent in the dominant language of the destination will have lower earnings. The more difficult issue is the extent to which earnings are lower.

These research questions are important for several reasons. One is that their answers will provide a better understanding of how labor markets operate, and the earnings determination process. This, of course, is important for issues of efficiency, income distribution and poverty. Another is that the answers shed light on the economic and non-economic incentives for, and the determinants of, an important aspect of skill formation. Thirdly, an understanding of these issues will provide better insights regarding public policy toward the maintenance of minority languages. As shown by Vaillancourt (1990), public policy in the US and Canada differ regarding minority languages and differ regarding the dominant languages (English in both countries and also French in Canada). Finally, language skills can have explicit and implicit roles in immigration policy and naturalization policy. The role of language in immigration policy differs in the two countries, as shown by Reimers and Troper (1990), and proposals for explicitly incorporating English-language skills in US immigration policy are currently under consideration in Congress.

Section II addresses the issue of the determinants of dominant language fluency among immigrants. After developing the theoretical framework, empirical analyses are performed for adult male immigrants in the United States using microdata from the 1980 Census of Population and in Canada using microdata from the 1981 Census of Canada. Section II closes with a comparative analysis of the US/Canadian findings.

Section III is an analysis of the role of dominant language fluency in determining earnings in the two countries. The interaction of language fluency with other determinants of earnings is also analyzed. The theoretical discussion is followed by earnings analyses for adult male immigrants in the two countries, again using microdata from the 1980 and 1981 Censuses.

Section IV is a summary and conclusion with implications for public policy.

The Appendices include the language questions used in the 1980 US and 1981 Canadian censuses, a detailed discussion of the variables used in the statistical analysis, and tables of the means and standard deviations of these variables.

II THE DETERMINANTS OF DOMINANT LANGUAGE PROFICIENCY

A. INTRODUCTION

In this section comparative analyses of the determinants of dominant language proficiency in both Canada and the US are presented. These analyses are based on Census data for each country: for Canada, the 1981 Census of Canada and for the US, the 1980 Census of Population. These sources include questions on fluency in speaking the dominant language, English in the US, and English or French in Canada. Data are not available in these sources on reading or writing skills in the dominant language. Furthermore, although there are data in the censuses on non-dominant languages spoken in the home, there is no information on the degree of proficiency in speaking, reading or writing non-dominant languages.

Special emphasis is placed on defining variables that are broadly comparable across the two data sets, and this has a bearing on the manner in which the investigations are conducted. While the 1981 Census of Canada contains three questions on language, only one can be used as an indicator of fluency in a dominant language: the so-called official language question on the Census permits respondents to be distinguished on the basis of their ability to speak one or both of the official languages of Canada well enough to carry on a conversation.[2] It is not possible to construct a measure of dominant language fluency with finer gradations from these data. In the US Census, however, individuals who spoke a language other than English in the home were asked to report their level of proficiency in English. Responses were coded into four categories: very well, well, not well and not at all. To facilitate the Canada-US comparisons, individuals who spoke only English in the home and those who spoke a language other than English in the home but who spoke English either very well or well, are distinguished from those less fluent in English.

Previous research [e.g., Veltman(1983)(1988), Chiswick(1989)] suggests that factors such as mother tongue, educational attainment, country of origin, duration of residence, age at arrival, and region of residence are important determinants of dominant language proficiency. To this list it seems reasonable to add variables for the presence of young children in the family, whether the individual had been in the Armed Forces, a minority group concentration measure, marital status and country of marriage. The relationships expected between these factors and dominant-language fluency are described below.

Country of birth may affect proficiency in the dominant language through an exposure factor. Countries differ in the extent to which particular languages are used as the dominant language, as a second language, or as the language of commerce. For example, individuals born in a predominately English-speaking country presumably know, or at least have been exposed to, the English language. Thus, immigrants from Britain, Canada, United States, Australia, New Zealand, the British West Indies and Ireland, for example, are arguably proficient in the English relevant for the US and Canada is spite of differences in accents, and minor differences in terminology, idioms and spelling.[3] For many Northern Europeans (e.g., the Dutch and Scandinavians),English is a second language, and hence English language fluency is presumably both greater at arrival and easier to acquire for them than for others.

Similarly, because of colonial experiences, fluency in the French language may be greater or easier to acquire among individuals born in Vietnam or Lebanon than among those born in Korea or Turkey.

Immigrants arriving as youths are likely to gain greater fluency in the destination language than older immigrants with the same number of years in the destination. Children appear to have a facility for acquiring new speaking language skills that diminishes sharply as they become adults. That is, their production function for acquiring dominant language skills is more efficient than it is for adults. In addition, youths gain a more intensive exposure to the dominant language through schools than do adults at home or in the labor market, and thus rapidly acquire fluency in the primary language of the destination country [Veltman(1988)]. Moreover, the benefits accruing to language skills will tend to be greater among youths, due to the complementarity between dominant language skills and other human capital (e.g., schooling) and their longer payoff period. Hence, from the human capital perspective, one also would expect that immigrants arriving as youths are more likely to undertake the investments necessary to become proficient in the dominant language.

Dominant language proficiency should vary directly with years since migration. The longer the individual has been in the host country, the more likely it is that he would have been exposed to the dominant language and hence acquired some language skills, or have improved existing skills. This adjustment factor has been emphasized in studies of the economic adjustment of immigrants that focus on the determinants of earnings and occupational status. In the present study we attempt to model the process explicitly. There may also be important interactions between levels of schooling and years since migration. Chiswick(1989), for example, argues that, in a population that initially has a very low level of fluency, the impact of education on immigrants' dominant language fluency should increase with duration of residence. His empirical evidence was consistent with this proposition.

Incentives to invest in dominant language skills also vary with the expectation of remaining in the destination. Other things the same, the higher the probability of return migration in the near term the weaker the incentives for investment in destination-specific skills, including dominant language skills. Therefore, the greater the expectation of return migration the poorer the fluency in the dominant language. While data are not available on the probability of return migration for specific individuals, it is known that return migration rates are much higher for some groups than for others. In the US context it is very high for Mexican immigrants but very low for another group of Hispanics, the Cubans. In the Canadian context, it is much higher for Italian and Greek immigrants than for the Vietnamese.

Although the exact casual process is open to debate, it is generally assumed that there will be a positive relationship between educational attainment and proficiency in the dominant language for immigrants from countries in which the dominant destination language is not the primary language. For these immigrants the positive effect on fluency of pre-immigration schooling may reflect the curriculum of the school attended, with second-language skills being learned only in the later years of schooling. More generally, it is likely that there is a complementarity between schooling and dominant language proficiency.

That is, those with more schooling would be more proficient in acquiring other forms of human capital, including language capital. The language of instruction is generally in the dominant language, and language capital perhaps more so than other capital is enhanced by exposure and own-usage. Causality may, however, also go in the opposite direction because of the complementarity of forms of human capital. Those with greater dominant language skills, other things the same, may have a greater productivity from additional schooling in the destination. The positive relationship between educational attainment and dominant language proficiency could also be the outcome of a third process. For example, those with higher levels of ability may acquire both more schooling and be more capable of mastering other skills, such as a second language.

It has been suggested above that an individual's incentive to acquire dominant language skills will be inversely related to the extent to which his native tongue is used in his present environment. deVries and Vallee(1980) report that the language composition of the individual's environment is important to understanding the distribution of bilingualism in Canada. Similarly, Chiswick(1989) suggests that within the Los Angeles area, the presence of a sizeable Spanish-speaking Mexican-origin enclave community may reduce the incentive to acquire English-language skills compared with other immigrants, other variables the same. Some insights into this issue can be gained by adding statistical controls to the estimating equation for the fraction of the regional population that has the same origin-language (e.g., Spanish is relevant for many countries of origin) as the individual concerned. This minority language concentration measure is similar in motivation to Veltman's(1983) battery of dummy variables for region of residence, constructed with reference to concentrations of minority language groups within geographic units in the US.

The presence of children in the household may affect the language acquisition process. There may be two factors at work here. First, children are expected to learn the dominant language more readily than their parents, in part because children appear to have superior language acquistion skills than adults, and in part because they are placed in circumstances that facilitate this (e.g., school, association with native-born children who speak the dominant language). Such skills may then be passed on to the parents within the home environment so that parents learn the dominant language from the children.[4] Alternatively, where young children are present, parents may attempt to facilitate the assimilation of the young by learning and only speaking the dominant language in the household. Finally, having children in the household (rather than leaving them in the origin or being childless) may reflect a stronger permanent attachment to the destination. Thus, in households where there are or have been young children, the older members of the household are expected to be more proficient in the dominant language. This effect can be expected to be larger if there is more than one child because of the language interaction between or among the children and the longer period of parental exposure.

Marital status could also affect dominant language fluency, although the most important influence may come from the timing of the marriage. If the individual was married prior to migration, it is more likely that the spouse is of the same language group. It is hypothesized that this would tend to weaken the incentive to become proficient in the language of the host country. On the other hand, marriage after migration is more likely to be with a dominant-language speaker. This suggests a differential effect of being married, depending on whether it is pre- or post-migration.

Finally, veteran status is expected to be associated with an increase in the probability that the individual is proficient in the dominant language, mainly through the remedial courses and dominant language exposure that the Armed Forces offer for individuals deficient in language skills.

The next sub-section contains the analysis of the determinants of English-language proficiency in the US. Following this, dominant language (English/French) fluency in Canada is studied. Section II concludes with a comparison of the major findings from the analyses of dominant language fluency in the two countries.

B. DOMINANT LANGUAGE PROFICIENCY IN THE UNITED STATES

The study of dominant language fluency in the US is based on the 1980 US Census of Population Public-Use Microdata Sample C. All foreign born 25-64 year old males employed in 1979 in this 1/100 random sample of the population are included in the analysis. Further details on the data are presented in Appendix B. Appendix B also contains descriptive statistics for the variables included in the estimating equation. Fully 80 percent of the sample are proficient in the English language, although this figure varies appreciably across birthplace regions. English-language fluency is almost universal (99.2 percent) among immigrants from English-speaking countries, while for immigrants from non-English-speaking countries the fluency rate is 76.6. The mean age of the sample is 41 years, and the average immigrant has been in the US for 16 years, and has 12 years of education. The distribution of the population across birthplace groups reveals that 17 percent of the sample originate from Mexico, 28 percent from Europe, 6 percent from Canada, 9 percent from Asia (South Asia, Vietnam, Other Asia) and 10 percent from South and Central America.

Table 1 presents results from OLS estimation of equations with the language proficiency measure GOODENG as the dependent variable.[5,6] GOODENG equals unity if the person speaks only English in the home, or, if another language is also spoken in the home, English is spoken either very well or well. GOODENG equals zero for those whose English speaking skills are not well or nil. These results are for the total adult-male foreign-born workforce. The estimates in column (i) of Table 1 are for a simple specification of the language model that includes neither the minority-language concentration measure that is one of the features of this study, nor interaction terms between variables. This specification permits some comparisons with earlier research. Column (ii) includes the minority-language concentration variable. Column (iii) adds two interaction terms to the estimating equation.

The estimates in the linear probability model presented in column (i) have a number of distinguishing features. Each additional year of education increases the probability of being proficient in English by 2.9 percentage points.[7] This partial effect is quite large. It implies, for example, that a person who attended college for three

TABLE 1

REGRESSION ESTIMATES OF ENGLISH-LANGUAGE FLUENCY AMONG ADULT FOREIGN-BORN MEN, US 1980: (Dependent Variable: GOODENG)

	(i)	(ii)	(iii)
Constant	0.549 (45.20)	0.568 (47.13)	0.514 (27.31)
Education	0.029 (60.75)	0.027 (58.08)	0.040 (53.20)
Age	-0.004 (16.00)	-0.004 (16.33)	-0.007 (15.66)
Years Since Migration(YSM)	0.019 (33.72)	0.020 (34.51)	0.026 (30.83)
YSM Squared/100	-0.028 (22.98)	-0.028 (23.93)	-0.035 (25.39)
Married	0.012 (2.30)	0.012 (2.38)	0.011 (2.04)
Married Overseas	-0.035 (6.86)	-0.035 (6.89)	-0.028 (5.43)
Child < 6 years only	0.001 (0.20)	0.004 (0.60)	0.007 (1.07)
Child 6-17 years only	-0.003 (0.62)	-0.001 (0.13)	0.007 (1.50)
Children < 6 & 6-17 years	0.003 (0.45)	0.009 (1.35)	0.018 (2.78)
Veteran	0.013 (3.22)	0.010 (2.45)	0.023 (5.86)
Rural Location	-0.013 (2.20)	-0.018 (3.06)	-0.018 (3.12)
South	0.003 (0.66)	0.018 (3.89)	0.017 (3.80)
Min. Language Concentration	(a)	-0.014 (20.59)	-0.014 (20.84)
Birthplace:			
Europe	-0.099 (25.65)	-0.092 (24.07)	-0.089 (24.02)

TABLE 1(continued)

	(i)	(ii)	(iii)
Vietnam	-0.131 (5.59)	-0.135 (5.76)	-0.150 (6.44)
Philippines	-0.018 (2.54)	-0.008 (1.19)	-0.026 (3.64)
China	-0.212 (21.20)	-0.207 (20.65)	-0.211 (21.38)
South Asia	-0.046 (7.02)	-0.047 (7.28)	-0.079 (11.93)
Other Asia	-0.156 (16.70)	-0.156 (16.71)	-0.169 (18.38)
Mexico	-0.314 (44.35)	-0.151 (14.25)	-0.142 (13.41)
Cuba	-0.282 (27.19)	-0.191 (16.81)	-0.181 (16.04)
Other America	-0.162 (22.38)	-0.083 (10.76)	-0.080 (10.42)
Africa	-0.028 (3.53)	-0.028 (3.55)	-0.050 (6.57)
Middle East	-0.052 (5.13)	-0.053 (5.35)	-0.053 (5.38)
Not Reported	-0.105 (12.50)	-0.061 (7.80)	-0.061 (7.91)
Age*YSM/100	(a)	(a)	0.015 (9.52)
Education*YSM/100	(a)	(a)	-0.082 (23.86)
Sample Size	32,255	32,255	32,255
Adj R^2	.3540	.3660	.3813

Note: 't' statistics in parentheses derived using White's(1980) heteroskedasticity consistent covariance matrix estimator.

(a) variable not entered.

Source: 1980 Census of Population, Public Use Sample, 1/100 Sample of the Foreign born.

years would have a predicted probability of being proficient in English 14.5 percentage points higher than a comparable individual who left school following the completion of tenth grade.

A higher fraction of the young than of the old have an adequate command of the English language, other things the same.[8] As these effects emerge when controlling for duration of residence in the US, the age variable can be interpreted as a measure of age at migration. From this perspective, the results suggest that immigrants arriving as youths are more likely to become proficient in English [see also Veltman(1988)]. This feature of the language proficiency model is also evident when the age variable is replaced by an 'age at arrival' measure.

Language skills increase with years since migration, but at a decreasing rate, until 34 years of residence.[9] This is consistent with the explanation often advanced in studies of earnings determination where the curvilinear relationship between earnings and duration of residence is often associated with adjustment factors, such as the acquisition of language skills. It is worth noting that the anglicization process reflected in these data continues 20 years longer than suggested by Veltman's analysis (15 years). This could reflect the different focus (all immigrants versus Veltman's immigrants of Spanish mother tongue), or the different statistical approaches (multivariate versus Veltman's bivariate analysis). The first of these explanations is investigated below.

Birthplace is also seen to matter to the explanation of the distribution of language skills. The ranking in order of skills is: English-speaking origin (the benchmark), Philippines, Africa, South Asia, Middle East, Europe, Not Reported, Vietnam, Other Asia, Other

America, China, Cuba and Mexico. The relatively low ranking of the Chinese and Spanish-speaking groups is consistent with findings reported by Veltman(1983). The Asian countries fall into two groups. English proficiency is greater among immigrants from the Philippines and South Asia, both of which are multilingual areas in which a legacy of the American and British administrations is that English came to be used as a lingua franca. The much poorer English proficiency of those from China, Vietnam and Other Asia (primarily Korea and Japan) may be attributable to the greater linguistic distance between their native languages and English. This argument, of course, cannot be used for the Spanish speaking Mexican and Cuban immigrants. For these immigrants the adverse effects on English language acquisition of many of the Mexicans viewing themselves as temporary migrants, and, as is shown below, of both the Mexicans and Cubans being more likely to live in large minority language enclaves, may be the compelling factors.

The similarity in the ceteris paribus ranking of Cuban and Mexican immigrants is somewhat surprising. Cuban immigrants have a lower probability of return migration, and hence would be expected to have a greater propensity to invest in US-specific human capital, including language capital. However, the greater incentive to invest which derives from this source may be offset by refugees being less likely to be favorably selected for migration.

The results in column (i) indicate that individuals who were married in the US are more likely to be proficient in English than those who never married, other things the same.[10] However, marriage prior to migration reduces the probability of being proficient in English below those who married after migration, and even below those who are not married. This result can be viewed as a simple extension of the language-group enclave argument; those married prior to migration are more likely to have a spouse fluent in the same immigrant language and to speak this language at home.

Veteran status is a statistically significant determinant of English-language proficiency, and it has the expected positive sign. Thus, individuals who had been in the US Armed Forces are more likely to be proficient in English, ceteris paribus.[11] Grenier and Vaillancourt(1983) report a similar finding.

The presence of young children in the household affects the level of language proficiency, but not in Table 1 equations (i) or (ii). The variable for the presence of children both under 6 and 6 to 17 is statistically significant in Table 1 equation (iii), but not the variables indicating the presence of one or more children under 6 or ages 6 to 17. That is, only the variable that indicates unambiguously the presence of at least two children is statistically significant. Perhaps it is the linguistic interaction between or among children that enhances parental fluency.[12]

There is, however, also an interaction effect on English language fluency between the effect of children in the household and duration of residence. Using a specification similar to the one in Table 1, column (i) and a one-in-fifty sample, the equation was recomputed for those who immigrated within the past 15 years (i.e., since 1965). When this is done, the dichotomous variable for the presence of one or more children in the household has a statistically significant partial effect (coefficient 0.0093, t-ratio = 1.98) on the English language fluency variable (Chiswick, 1990). Thus, it appears that the presence of children has a larger effect on enhancing parental English-language fluency among the more recent immigrants.

Rural residence is associated with a marginally significant lower level of fluency, while southern residence is associated with greater reported fluency. The latter effect, however, is significant only when the minority language concentration variable is held constant. By implication, fluency is least in the rural, non-South and greatest in the urban, South, other things the same.

Column (ii) in Table 1 adds the minority-language concentration measure to the estimating equation. This variable is defined as the percentage of the population in the state speaking the same foreign language as the respondent for the 20 numerically most populous languages. If the respondent speaks only English at home or a language not in the top 20 the variable is defined to be zero. There is a very strong effect of minority language concentration. Immigrants living in states which have a relatively high representation of their language group are less likely to be fluent in English, other things the same. Comparing, for example, a State where one percent of the population spoke Spanish at home with a State where 10 percent spoke Spanish at home, Spanish-background workers in the second state would have a rate of English-language fluency 14 percentage points lower than similar workers in the first State.[13] The inclusion in the estimating equation of the minority-language concentration variable has a marked impact on the Mexican, Cuban and Other America birthplace dummy variables. The partial effect of being born in Mexico or Other America falls by one-half, and that of being born in Cuba by one-third. As discussed below, this enclave effect also operates within individual birthplace regions, and therefore the minority language concentration measure does not appear to be acting simply as a surrogate for birthplace.

Table 1, Column (iii) adds several interaction terms to the basic estimating equation. The coefficient on the interaction term between age and years since migration is positive, and this reinforces a finding discussed earlier. That is, immigrants arriving at an older age have lesser fluency initially but a more rapid improvement.

The second interaction term included in the Table 1 column (iii) specification is between education and years since migration. The negative coefficient here reveals that the (positive) partial effect of educational attainment on English language fluency diminishes with duration of residence in the US. The implication is that it takes a longer duration in the U.S. for those with less schooling to acquire the same level of English language proficiency. This finding contrasts with the finding reported in Chiswick(1989) for a study of low-skilled illegal aliens in the US for a short period of time. However, Chiswick(1989) held constant fluency at immigration, a variable not available in the census, and which is positively correlated with level of education. The finding here is consistent with some analyses of earnings determination. Chiswick(1978), for example, reported that the partial effect of education on earnings among immigrants from English-speaking countries declines the longer they have been in the US. In other words, the complex pattern of effects which education appears to have on earnings may originate from the adjustment process associated with the learning of the dominant language.

Table 2 develops the analysis of the minority language concentration effect by incorporating into the model interaction terms between the minority language variable and education, age and years since migration. The inclusion of these interaction terms does not affect the coefficients on other variables in any material way. The estimates listed in Table 2 show that the language concentration effect varies significantly with education, age and years since migration. The adverse effect on English language skills of living in an ethnic language enclave is greater for those with less skill (i.e., less

TABLE 2

SELECTED REGRESSION COEFFICIENTS FOR ENGLISH FLUENCY MODEL WITH MINORITY LANGUAGE CONCENTRATION INTERACTION TERMS, ADULT FOREIGN-BORN MEN, US 1980

	(i)	(ii)	(iii)	(iv)
Education	0.027 (58.08)	0.021 (40.21)	0.021 (40.37)	0.021 (41.23)
Years Since Migration (YSM)	0.020 (34.51)	0.019 (33.99)	0.019 (34.09)	0.017 (28.31)
YSM Squared/100	-0.028 (23.93)	-0.028 (23.61)	-0.028 (23.68)	-0.026 (21.41)
Age	-0.004 (16.33)	-0.004 (16.21)	-0.003 (14.86)	-0.003 (10.99)
Min. Language Concentration (CONC)	-0.014 (20.59)	-0.030 (26.62)	-0.027 (13.84)	-0.022 (11.24)
CONC * Education	(a)	0.002 (19.84)	0.002 (19.33)	0.001 (16.04)
CONC * Age/100	(a)	(a)	-0.007 (1.90)	-0.036 (8.70)
CONC * YSM/100	(a)	(a)	(a)	0.060 (14.85)
Sample Size	32,255	32,255	32,255	32,255
Adj R^2	.3660	.3765	.3766	.3829

For notes and source, see Table 1. In addition to the variables listed, all other control variables used in Table 1 are included in these equations.

Partial derivatives [from column (iv)] evaluated at sample means are:

$$\delta GOODENG/\delta EDUC=0.021+0.001\ CONC=0.025$$

$$\delta GOODENG/\delta Age=-0.026-0.00036\ CONC=-0.027$$

$$\delta GOODENG/\delta YSM=0.017-0.00052\ YSM+0.0006\ CONC=0.011$$

$$\delta GOODENG/\delta CONC=-0.022+0.001\ EDUC-0.00036\ Age+0.0006\ YSM=-0.015$$

schooling, more recent arrivals and who immigrated at an older age). These are the immigrants with the lowest language facility, ceteris paribus.

Further insights into the determination of English-language proficiency among immigrants can be gained by disaggregating the analysis by birthplace region. Of particular interest are the analyses, summarized in Table 3, for the major birthplace groups, especially the Spanish speaking groups that have attracted the most attention in previous research.

Educational attainment exercises a strong positive influence on language fluency in each birthplace region. The effect is greatest for immigrants from Vietnam, China, Cuba and Mexico, and lowest for immigrants from Africa, South Asia, Middle-East, Philippines and Europe. The former groups are characterised by relatively low language fluency at arrival in the US, and the latter groups by relatively high language fluency at arrival (see Table 1). It appears, therefore, that while education can help overcome language handicaps, its impact depends on the extent of initial language deficiency; Education is more important the lower the initial level of proficiency.

The number of years since migration also has a strong positive influence on language fluency for all birthplace regions. The speed of language adjustment is greater among immigrants from Mexico, Cuba, and Other America than for the remaining birthplace groups.[14] These are the least endowed with respect to language skills at arrival. Hence, the story here is akin to that which has been reported in the earnings determination literature: immigrants having the lowest skill level upon arrival in the US will be characterised by relatively rapid adjustment. This consistent pattern is suggestive of an underlying structure common to both language capital accumulation and all forms of human capital relevant for the destination, which get translated in the labor market into earnings.

The minority language concentration measure is significant and negative in six of the twelve disaggregated analyses and negative but not statistically significant in four others (Table 3). The estimated effects for Mexico, Cuba and Other Americas are all of the same order of magnitude, suggesting that the Spanish language groups are fairly homogeneous with respect to the language enclave effect. As noted earlier, the fact that this enclave variable is significant within birthplace regions for the Spanish origin group indicates that it is more than a proxy for country of birth.[15] The insignificance of the language concentration measure in other birthplace regions (Vietnam, Philippines, China, Other Asia, Middle East) may arise because the concentration of those speaking these languages is too small for linguistic enclaves to retard English language fluency.[16]

Finally, the partial effect of the 'married overseas' variable is nearly consistently negative (Table 3). It is negative and significant (at the 5 percent level) in the case of immigrants from Europe, Mexico and Cuba, and negative but not significant for most other birthplace groups.[17] The insignificance of this variable for the small sample of Vietnamese immigrants is not surprising; 92 percent of Vietnamese immigrants entered the US after 1975, and thus few would have married in the US prior to Census enumeration in 1980. Moreover, the concentration of this wave of migration in such a short period implies that the foreign marriage variable may be measured imprecisely (see Appendix B).

TABLE 3

SELECTED REGRESSION COEFFICIENTS FOR ENGLISH-LANGUAGE FLUENCY BY PLACE OF BIRTH, ADULT FOREIGN-BORN MEN, US, 1980(a)

Birthplace (% fluent)	Education	YSM	YSM Squared(a)	Minority Concent.	Married Overseas	Sample Size
Non-English	0.029	0.022	-0.031	-0.013	-0.035	27850
Total	(57.28)	(33.59)	(22.13)	(19.74)	(6.13)	
(76.63)						
Europe	0.022	0.023	-0.034	-0.019	-0.049	8971
(87.54)	(27.00)	(21.10)	(16.31)	(7.53)	(5.16)	
Vietnam	0.053	0.017	-0.031	0.012	0.016	335
(70.75)	(7.01)	(1.27)	(0.55)	(1.01)	(0.29)	
Philippines	0.021	0.004	-0.005	-0.009	-0.003	1181
(95.09)	(7.55)	(1.50)	(0.83)	(1.59	(0.17)	
China	0.039	0.018	-0.018	-0.009	-0.048	1289
(75.56)	(18.71)	(5.25)	(2.47)	(0.57)	(1.63)	
South Asia	0.012	0.002	0.003	0.012	0.015	1007
(98.11)	(3.94)	(0.91)	(0.49)	(2.84)	(1.48)	
Other Asia	0.034	0.023	-0.039	-0.013	-0.030	1575
(80.83)	(12.98)	(7.48)	(4.80)	(1.22)	(1.23)	
Mexico	0.037	0.025	-0.035	-0.012	-0.069	5602
(48.30)	(26.86)	(13.60)	(7.94)	(9.32)	(4.57)	
Cuba	0.039	0.031	-0.034	-0.009	-0.059	1649
(64.71)	(17.32)	(6.97)	(3.36)	(3.76)	(2.26)	
Other America	0.033	0.030	-0.049	-0.013	-0.004	3121
(75.62)	(18.99)	(13.32)	(9.68)	(10.85)	(0.24)	
Africa	0.011	0.007	-0.013	-0.014	0.036	670
(97.31)	(3.74)	(3.20)	(2.27)	(1.90)	(2.36)	
Middle East	0.017	0.012	-0.017	-0.001	-0.040	804
(90.67)	(6.63)	(3.73)	(2.30)	(0.08)	(1.52)	
Not Reported	0.021	0.015	-0.021	-0.020	-0.008	1646
(83.84)	(9.82)	(6.55)	(4.45)	(10.90)	(0.34)	

Note: 't' statistics in parentheses derived using White's(1980) heteroskedasticity-consistent covariance matrix estimator.

(a) = additional control variables are: age, married, child < 6 only child 6-17 only, children < 6 and 6-17, rural, south and veteran status.
(b) = Variable divided by 100.

Source: Same as Table 1.

C. DOMINANT LANGUAGE PROFICIENCY IN CANADA

The analysis of dominant language fluency in Canada is based on the 1981 Census of Canada. Two data files are available: the 1 in 100 Household/Family File and the 1 in 50 Individual File. The relevent features of these two files are reported in Table 4.

The relative strength of the Individual File lies in the more detailed information available on home language usage, its larger sample size, and the availability of data on citizenship. The four additional categories of home language coded in the Individual File should allow the impact of the important minority language concentration variable to be measured more precisely. Where the focus of attention is whether the impact of this or other variables differs between birthplace groups, the larger sample size (23,741 observations compared to 11,382) of the Individual File will provide a superior basis for analysis. Finally, the data on citizenship will permit the estimation of a model of earnings determination in Section III which corresponds to that estimated using the US data.

The comparative strength of the Household/Family File is that it contains data on the number and age structure of children, the language usage of children, the birthplace of spouse and spouse's language usage that are not available from the Individual File. Therefore, only the Household/Family File permits an investigation of the key issues of whether the language attainment of adult males is related to characteristics of their spouse and children.

Full use was made of both sets of data. In the first instance a preliminary analysis was conducted using the 1 in 100 Household/Family File to establish the roles of children and of spouse's birthplace in the model of dominant language proficiency in Canada. The 1 in 50 Individual File is then used to obtain a more accurate measure of the

TABLE 4

CHARACTERISTICS OF 1981 CENSUS OF CANADA DATA FILES

Variables Available in Data	**Household/ Family File**	**Individual File**
Foreign Marriage	Yes	Yes
Citizenship	No	Yes
Spouse's Home Language	Yes	No
Children's Home Language	Yes	No
Presence/Age of Children	Yes	No
Minority Language	4 groups	8 groups
Sample Size (Adult Foreign Born Men)	11,382	23,741

Source: Statistics Canada: Census of Canada, 1981, Public Use Sample Tapes, User Documentation.

minority language concentration effect, and to examine whether this effect differs between birthplace groups.

The striking feature of the data is the very high rate of dominant language fluency. Almost 97 percent of immigrants report themselves as being able to speak English or French well enough to conduct a conversation. There is some variation in dominant language proficiency across the major birthplace regions. Immigrants from the English/French speaking countries have a rate of fluency, for all practical purposes, of 100 percent (two respondents in the sample reported a dominant language deficiency), while immigrants from Chinese-Asia, Southern Europe, and Southern and Central America have relatively lower rates of dominant language fluency (87 percent, 92 percent and 95 percent, respectively). The much higher rate of dominant language fluency in Canada than in the US (where 80 percent of immigrants are classified as fluent in the dominant language) reflects in part the different definitions used (see Appendix B).[18] It also arises in part because of the use in Canada of knowledge in the official languages in the immigration selection procedure.[19]

The examination of the influence of family environment factors on dominant language proficiency in Canada based on the Household/Family File (not reported here) can be summaried succinctly. First, children do not appear to affect the dominant language fluency of their parents. This may be attributable to the fact that dominant language fluency is virtually universal in Canada, implying that the exposure factor associated with children's conversations is likely to be of minor importance.[20] Second, foreign marriage reduces the probability of dominant language fluency in the destination country, and this influence carries over when variables for the birthplace of the spouse, wife's home language or wife's mother tongue are included in the estimating equation. This suggests that the foreign marriage variable captures influences on the language outcome other than merely the country of origin of the partner or of language usage within the home.[21] Included here may be custom and cultural factors, and larger family networks in the country of origin, that promote a greater propensity to identify with the country of origin through both origin-language retention and eschewing the dominant language of the destination country.

The remainder of this sub-section is based on the Individual File. These analyses have a similar starting point as the analysis of the US labor market presented in Table 1. Thus, in column (i) of Table 5, results from a baseline specification of a linear probability model of language fluency are presented. In this equation, dominant language proficiency is related to education, age, years since migration and its square, marital status, overseas marriage status, birthplace, and province and region of residence. In the column (ii) specification the minority language concentration measure is added to the basic estimating equation. Columns (iii) to (v) list results for specifications that include interaction terms between the minority language concentration measure and educational attainment, age and duration of residence.

The general pattern of results in the Table 5 column (i) model is remarkably similar to that established for study of dominant language proficiency in the US. The magnitude of individual estimated effects differ considerably between the two analyses, however, and these differences are discussed in the following sub-section.

Years of education and age exercise major influences on dominant language skill, with each additional year of education being associated with about a 1 percentage point improvement in the rate of dominant

TABLE 5

REGRESSION ESTIMATES OF DOMINANT-LANGUAGE FLUENCY AMONG ADULT FOREIGN-BORN MEN CANADA, 1981
(Dependent Variable: GOODLANG)

	(i)	(ii)	(iii)	(iv)	(v)
Constant	0.909	0.909	0.929	0.919	0.932
	(106.53)	(107.10)	(114.59)	(129.90)	(134.75)
Education	0.007	0.006	0.004	0.004	0.003
	(18.90)	(16.73)	(12.13)	(12.80)	(11.61)
Age	-0.002	-0.001	-0.001	-0.001	-0.001
	(10.98)	(10.16)	(9.43)	(9.47)	(5.69)
Years Since Migration (YSM)	0.006	0.007	0.007	0.007	0.005
	(13.46)	(13.99)	(14.66)	(14.85)	(10.89)
YSM Squared/100	-0.009	-0.009	-0.010	-0.010	-0.008
	(9.68)	(10.39)	(11.32)	(11.56)	(9.27)
Married	-0.001	-0.001	0.001	0.001	0.003
	(0.29)	(0.30)	(0.55)	(0.63)	(1.57)
Married Overseas	-0.016	-0.013	-0.013	-0.012	-0.009
	(5.32)	(4.48)	(4.37)	(4.27)	(3.18)
CMA	-0.009	-0.002	-0.001	-0.001	-0.001
	(4.61)	(0.99)	(0.78)	(0.77)	(0.33)
Province:					
Atlantic	-0.001	-0.001	0.001	0.001	0.001
	(0.01)	(0.30)	(0.33)	(0.32)	(0.20)
Quebec	0.012	0.010	0.011	0.011	0.009
	(3.80)	(3.05)	(3.36)	(3.35)	(2.92)
Prairie	0.009	0.005	0.005	0.005	0.003
	(3.58)	(2.09)	(2.13)	(2.21)	(1.44)
British Columbia	0.007	0.007	0.004	0.004	0.006
	(3.11)	(2.77)	(1.56)	(1.58)	(2.81)
Min. Language Concentration (CONC)	(a)	-0.018	-0.059	-0.038	-0.048
		(11.49)	(13.46)	(3.84)	(4.95)
Birthplace:					
Western Europe	-0.013	-0.011	-0.015	-0.015	-0.007
	(9.60)	(8.65)	(11.96)	(11.86)	(6.94)
Eastern Europe	-0.004	-0.003	-0.009	-0.009	-0.007
	(1.65)	(1.42)	(3.70)	(3.98)	(2.86)
Southern Europe	-0.057	-0.029	-0.032	-0.032	-0.029
	(17.66)	(9.22)	(10.21)	(10.11)	(9.57)

TABLE 5(continued)

	(i)	(ii)	(iii)	(iv)	(v)
Chinese-Asia	-0.095 (11.02)	-0.065 (7.31)	-0.095 (10.29)	-0.094 (10.28)	-0.064 (7.14)
Other Asia	0.003 (1.06)	0.004 (1.40)	0.006 (2.03)	0.006 (2.31)	-0.003 (1.15)
Mexico, South & Central America	-0.024 (2.53)	-0.021 (2.21)	-0.023 (2.33)	-0.022 (2.26)	-0.029 (2.92)
Africa	0.010 (3.77)	0.011 (4.23)	0.013 (4.67)	0.013 (4.93)	0.005 (1.89)
Other	-0.003 (0.79)	-0.004 (0.95)	-0.006 (1.52)	-0.005 (1.42)	-0.007 (1.83)
CONC * Education	(a)	(a)	0.005 (11.62)	0.004 (9.39)	0.004 (9.43)
CONC * Age/100	(a)	(a)	(a)	-0.039 (2.37)	-0.179 (9.62)
CONC * YSM/100	(a)	(a)	(a)	(a)	0.351 (15.63)
Sample Size	23,741	23,741	23,741	23,741	23,741
Adj R^2	.1058	.1214	.1386	.1395	.1840

Note: 't' statistics in parentheses derived using White's(1980) heteroskedasticity consistent covariance matrix estimator.

(a) variable not entered.

Partial derivatives [from column (v)] evaluated at sample means are:

$\delta\text{GOODLANG}/\delta\text{Education}=0.003+0.004\ \text{CONC}=0.005$

$\delta\text{GOODLANG}/\delta\text{Age}=-0.001-0.002\ \text{CONC}=-0.002$

$\delta\text{GOODLANG}/\delta\text{YSM}=0.005-0.00016\ \text{YSM}+0.004\ \text{CONC}=0.004$

$\delta\text{GOODLANG}/\delta\text{CONC}=-0.048+0.004\ \text{EDUC}-0.002\ \text{Age}+0.004\ \text{YSM}=-0.009$

Source: 1981 Census of Canada, Public Use Sample, Individual File, 1/50 Sample of the Foreign born.

language fluency.[22] There is a negative relationship between age and language fluency, other things, including years since migration, the same. As noted earlier, the interpretation of this variable is that the older an individual at the time of migration, the less likely that person is to acquire dominant language skills.

The influence of years since migration on dominant language proficiency is non-linear, with the partial effect of this variable on the probability of being proficient in the dominant language being given by $\delta \mathrm{GOODLANG}/\delta \mathrm{YSM}=0.006-0.00018\mathrm{YSM}$. Evaluated at 10, 20 (=approximately the mean) and 30 years' residence in Canada, the partial effect is 0.4, 0.2 and 0.1 percentage points respectively. While these partial effects may appear small, years since migration has a substantial impact on the overall pattern of dominant language fluency. There is, for example, an eight percentage point difference in the rates of dominant language proficiency of a recent arrival and a comparable immigrant with the mean duration of residence in Canada. The process of adjustment captured by the years since migration variable continues for 35 years. It is remarkable that, even though the US and Canada differ greatly in terms of the relative size of their immigrant stock (5 percent versus 25 percent of their workforces respectively), the nature of their dominant languages (English only versus English and French), and the definition of fluency, the relationship between years since migration and dominant language fluency should be so similar.

Marital status per se does not exercise an independent influence on language skills. However, where the individual was married prior to migration, there is a statistically significant reduction in the probability of dominant language fluency.

Province of residence appears to exercise an independent impact on the rates of dominant language fluency. Residents of Quebec, British Columbia and the Prairie provinces have rates of dominant language skills that are significantly higher than in the other provinces, but the estimated differences are quite small: about 1 percentage point in each instance.

Finally, the birthplace controls indicate that immigrants categorised as "Chinese-Asians" have a rate of dominant language proficiency 10 percentage points lower than the benchmark group of immigrants from dominant-language speaking countries, other variables the same. Southern Europeans are also distinguished by a lower level of language skills; their rate of dominant language proficiency being 5.7 percentage points lower than that of the benchmark group. Three other birthplace groups are characterised by small, statistically significant, differences in the level of language skills: Eastern Europe (at the 10 percent level), Western Europe and the Southern and Central American group. Immigrants from Africa are shown to have a rate of dominant language fluency significantly greater than that of the benchmark group of immigrants from English-speaking countries, but this result appears to derive from the application of OLS to a bounded variable having a mean close to a bound.[23] The relatively high rate of dominant language deficiency among the Southern Europeans is broadly consistent with previous analyses by deVries and Vallee(1980) who report that immigrants from Mediterranean countries have a high propensity to retain their origin language.

The position of the Chinese-Asians, however, does not appear to have emerged as a focal point in previous discussion. The larger coefficient for this group is consistent with the greater linguistic distance between Chinese and the dominant languages.

Column (ii) adds the minority language concentration variable to the analysis. As outlined in Appendix B, this variable measures the percentage of the population in the region (23 localities defined using the Census Metropolitan Area and Province variables) that has the same non-dominant home language as the respondent. The estimated impact of the language concentration variable is sizeable, -0.018, and is highly significant ('t'=11.49).[24] Thus, if a region has a concentration of people speaking the same non-dominant home language as the respondent which is 5 percentage points above the national average, the respondent's probability of being fluent in a dominant language would fall by 9 percentage points. Including the minority language concentration variable in the analysis has a negligible impact on the estimated effects of the other regressors, other than for the Southern European birthplace variable. The disadvantage, ceteris paribus , of a Southern European birthplace declines by around 3 percentage points, from -0.057 to -0.029. This decline probably reflects the explicit recognition of the Greek language in the language enclave measure used in Table 5.

The estimated impact of the minority language concentration variable in Table 5 (-0.018) is stronger than that reported in the study of language attainment in the US labor market (of -0.014), a difference which is statistically significant ('t'=2.35). It is possible that this is associated with a difference in the method of constructing the variable for the two countries. In the case of the US, the variable is defined with reference to the state in which the respondent lives. In the case of Canada, however, for approximately one-half of all respondents the variable is defined with reference to the particular city (i.e., Census Metropolitan Area) in which they live. The Canadian variable, even though defined for fewer language categories than the US equivalent (8 compared to 20), may nevertheless provide a more accurate proxy of the underlying language enclave effect that we are attempting to capture, and this may be what is reflected in the estimated coefficients.

Columns (iii) to (v) of Table 5 examine the interactions between the minority language concentration measure and education, age and years since migration. The findings here are in accord with those reported for the study of the US labor market: the minority language enclave effect is strongest among recent, adult immigrants who have below average levels of education. The analysis of the Canadian data reveals these to be the groups possessing fewest dominant language skills, ceteris paribus.

Table 6 presents results from estimation of the model of dominant language fluency for each of the major non-English/French speaking birthplace groups. A number of differences in the relationships between dominant language fluency and education, duration of residence in Canada, foreign marriage and the language enclave variable are evident.

When reading the results in Table 6 it is essential to keep in mind the limited data on dominant language fluency and limited number of languages identified in the 1981 Census, and hence used to construct the minority language concentration measure. Owing to this factor, the variable is not expected to have any power of discernment for some birthplace groups (e.g., Mexico, Southern and Central America, since Spanish is not a separately identifiable language). Nevertheless, despite this shortcoming, the analysis by birthplace group provides further strong evidence on the language attainment model in Canada.

There is a strong positive association between educational attainment and dominant language fluency for most birthplace groups.

TABLE 6

SELECTED REGRESSION COEFFICIENTS FOR DOMINANT-LANGUAGE FLUENCY BY PLACE OF BIRTH, ADULT FOREIGN-BORN MEN, CANADA, 1981

Birthplace (% fluent)	Education	YSM	YSM(a) Squared	Minority Concent.(b)	Married Overseas	Sample Size(c)
Non-Dominant Language Total (95.91)	0.008 (16.28)	0.010 (13.87)	-0.014 (9.74)	-0.017 (10.48)	-0.017 (3.86)	16092
N. Europe(d) (99.94)	0.001 (1.37)	0.001 (0.96)	-0.001 (0.97)	-0.003 (0.83)	-0.000 (0.07)	3248
E. Europe (99.01)	0.012 (2.17)	0.004 (2.39)	-0.006 (1.99)	-0.014 (1.99)	-0.014 (2.13)	2229
S. Europe (91.96)	0.010 (9.67)	0.021 (9.82)	-0.032 (6.73)	-0.015 (8.31)	-0.035 (3.52)	5511
Chinese-Asia (88.60)	0.024 (8.81)	0.019 (4.74)	-0.025 (2.25)	-0.008 (1.59)	0.002 (0.10)	1132
Other Asia (98.63)	0.004 (4.02)	0.005 (3.89)	-0.008 (2.96)	-0.022 (1.27)	0.001 (0.14)	2040
Africa (99.72)	0.002 (1.33)	0.001 (1.24)	-0.002 (0.84)	-0.001 (0.40)	0.003 (0.39)	703
Mexico, South & Central America (95.00)	0.010 (3.67)	0.014 (2.79)	-0.026 (2.01)	0.002 (0.13)	-0.012 (0.49)	480
Other (98.93)	0.003 (2.30)	0.002 (0.95)	-0.001 (0.42)	-0.008 (0.65)	-0.028 (2.29)	749

Note: 't' statistics in parentheses derived using White's(1980) heteroskedasticity-consistent covariance matrix estimator.

(a) = Variable divided by 100
(b) = The 8 identifiable languages used in the construction of this variable are Chinese, German, Italian, Ukrainian, Greek, Netherlandic languages, Polish, Portuguese.
(c) = Additional control variables are: age, married, province and resident of metropolitan area.
(d) = Equation is at the margin of statistical significance, the computed F values being 1.778.

Source: Same as Table 5.

The impact is largest for the Chinese-Asians, the group with the lowest level of language proficiency upon arrival in Canada. Conversely, for the two groups with the highest level of initial language fluency, Northern Europe and Africa (see the Table 5 results), the education variable is insignificant. Hence, the conclusion from this analysis parallels that for the US: education is an important determinant of dominant language fluency, but it is more important the lower the initial level of proficiency.

The impact of years since migration is generally positive, but differs considerably across the birthplace groups. The ranking of birthplaces in terms of impact of years since migration on language fluency is approximately the inverse of their ranking in terms of mean level of language fluency. Thus, the impact of years since migration is greatest for immigrants from Chinese-Asia and Southern Europe, the two groups with the lowest mean levels of language fluency. Levels of language fluency do not vary significantly with years since migration for immigrants from Northern Europe, Africa or the "Other" birthplace groups, each of which has a relatively high level of language skill.

As expected, the performance of the minority concentration variable is mixed. It is generally negative, but is significant only for the Eastern Europe and Southern Europe birthplace regions (which, however, comprise 48 percent of the non-dominant language sample). While the estimated language enclave effect for Eastern Europe is close to that derived on the basis of the aggregated data (see Table 5), the effect for Southern Europe is twice that reported earlier. This result may reflect the better quality data, that is, the use of three important language groups (Italian, Greek and Portuguese) in the construction of the language enclave variable relevant to the Southern European region.

Finally, the foreign marriage variable is significant for three birthplace groups and insignificant for the remaining five. For the cases where it is statistically significant, the estimated impact is negative, but differs by birthplace region. Marriage overseas, for example, reduces the probability of dominant language fluency by 1.4 percentage points for immigrants from Eastern Europe, but by 3.5 percentage points for immigrants from Southern Europe.

Study of the dominant language attainment process within each birthplace group yields a pattern of results which is broadly consistent with the aggregate analysis. Education, years since migration, foreign marriage and minority concentration exercise important influences on dominant language fluency. The larger impact of the human capital variables of education and years since migration for birthplace regions with lower initial levels of dominant-language proficiency emerges as a major finding of the disaggregated analysis.

D. U.S.-CANADIAN COMPARISONS

Canada and the US differ appreciably in terms of the fraction of the population foreign-born, the source countries of immigrants, and the methods use by the authorities for selecting immigrants. About one-quarter of the Canadian workforce is foreign-born, compared with 5 percent in the US. In Canada the immigrant stock is largely of UK or European origin (66 percent), although there is a sizeable group of recent Asians (13 percent). In the US the largest immigrant group is from Latin America. Canada has a skill-based points system for entry, whereas most of the stock of immigrants in the US would have entered that country on the basis of kinship. Under the definitions used for this study, 97 percent of Canada's immigrants report that they are "fluent" in a dominant language, whereas only 80 percent of immigrants in the US are "fluent" in English.[25]

Despite these differences, the immigrant experience in dominant language fluency is remarkably similar in the US and Canada. Education, age at arrival, years since migration, foreign marriage, minority language concentration and country of birth affect dominant language fluency in the hypothesized direction in each country. That is, dominant language fluency among adult men increases with years of education and duration in the destination, it decreases with age at arrival, foreign marriage and minority language concentration. Fluency also varies with country of origin in accordance with the extent to which the dominant language of the destination country is used in the origin country.

The magnitudes of the estimated effects of the explanatory variables on language fluency differ between Canada and the US. Comparing columns (i) and (iii) in Table 7, indicates that while the model of dominant language fluency performs similarly in the two countries, the estimated impacts for the US are consistently two to three times larger that those computed for Canada. The one exception is the impact of minority language concentration on dominant language fluency, where the impacts estimated for each country are broadly similar. The differences between the US and Canada may either be substantive or merely reflect the different definitions of dominant language usage. To ascertain the weights that should be attached to these explanations, the language fluency variable for the US was redefined so that only individuals who spoke English "Not at all" are in the not fluency category. This gives a level of dominant language fluency for the US of 95 percent which is comparable to the 97 percent fluency rate for Canada. Results from the estimation of the language

TABLE 7

PARTIAL EFFECTS OF SELECTED VARIABLES ON LANGUAGE FLUENCY, US AND CANADA

Variable	**US (i)**	**US (assuming "Canada Definition") (ii)**	**Canada (iii)**
Education	0.027	0.009	0.006
Age	-0.004	-0.001	-0.001
Years Since Migration[a]	0.014	0.006	0.005
Years Since Migration[b]	0.009	0.003	0.003
Married	0.012	0.009	-0.001[c]
Married Overseas	-0.035	-0.012	-0.013
Minority Language Concentration	-0.014	-0.005	-0.018

(a) = evaluated at 10 years of residence

(b) = evaluated at 20 years of residence

(c) = estimated effect not significant at the 5 percent level

Source: Tables 1 [column (ii)] and 5 [column (ii)].

fluency model using this alternative definition of the dependent variable are summarised in column (ii) of Table 7.

For all variables other than the minority language concentration variable, the column (ii) results for the US are of the same order of magnitude as for Canada. This suggests that the differences between the Table 5 results for Canada and the Table 1 results for the US are largely definitional.

One implication is that the category for fluency in an official language in the Canadian Census is too broad, being equivalent to the "well", "very well", and "not well" categories in the US data. A question that determines more precisely the degree of language fluency in Canada, as is done in the US 1980 Census [question 13c-see Appendix A], is recommended.

There is a striking difference between the language enclave effects for the two countries, where, in contrast to the other findings, the estimated impact is considerably stronger for Canada than for the US. This is likely to reflect the information on city of residence used in the construction of this variable for one-half of respondents in the Canadian data compared to state of residence for all respondents in the US analysis.

Dominant language fluency, therefore, is amenable to statistical analysis, and such analysis yields consistent patterns for the US and Canadian labor markets.

III LANGUAGE PROFICIENCY AND EARNINGS

A. INTRODUCTION

In this section the importance of proficiency in the dominant language to the explanation of variations in earnings within and across labor market groups is examined. The framework for the analysis follows that developed in Section II. Initially, statistical analysis of the 1980 US Census of Population is conducted. Then, a similar investigation of the 1981 Canadian Census is undertaken. The section concludes with a series of comparisons and contrasts between the roles of dominant language proficiency in the two North American labor markets.

The model of earnings determination employed is a human capital earnings function in which the natural logarithm of earnings is related to years of schooling, labor market experience, weeks worked, marital status, region of residence and a series of immigrant variables that includes birthplace, duration of residence, proficiency in the dominant language and citizenship. In this characterization of the earnings determination process, the duration of residence, proficiency in the dominant language and citizenship variables capture dimensions of the economic adjustment process among immigrants.

The relationship between earnings and duration of residence is generally held to reflect the learning about the institutions and idiosyncrasies of the labor market of the host country, cultural adjustment factors, the development of networks of labor market contacts, and investments in country-specific human capital skills that lead to labor market success. Included in these actions would be the taking out of citizenship. Citizenship may open doors to better paying jobs, and would be expected to be associated with a monetary reward sufficient to offset any non-monetary costs such as having to forfeit citizenship of the country of origin. Naturalization generally requires the demonstration of at least a minimum level of fluency in the dominant language. It also reflects a commitment to the host country. Similarly, learning the language of the host country reflects a commitment to the adopted country and an adaptation to the circumstances of that country. As has been noted previously, learning the language may provide access to better jobs and hence be associated with higher earnings.

The rates at which different immigrant groups adjust to the labor market have been found to vary considerably. Immigrants who enter North America with relatively few internationally transferable skills (e.g., immigrants from non-English speaking countries) or who are less favorably selected for migration (e.g., refugees) have fewer destination-specific skills at arrival, ceteris paribus, and, consistent with expectations, are typically characterised by a lower earnings profile but a relatively more rapid earnings growth with duration of residence, other things the same.

Greater dominant language fluency enhances earnings. However, dominant language fluency is also expected to be related to the gains in earnings associated with language skill acquisition. In these circumstances, due to correlation between the language choice variable and the disturbance term, estimation of the earnings equation by least squares would, in principle, result in inconsistent estimates.

This feature of the data may be accommodated using either an instrumental variable (IV) estimator or the sample selectivity methods developed by Heckman(1979) whereby the inverse Mills ratio is added to the estimating equation.[26] The use of the Instrumental variables estimator facilitates a test of endogeneity using the Hausman(1978) test, while the significance of the inverse Mills ratio terms provides a similar test with the alternative estimator. Both tests suggest that the language variable is endogenous in the earnings equations estimated for both the US and Canada. That is, the empirical results suggest that better language skills affect earnings and that the greater the economic return to language skills, the greater the language fluency.

B. THE UNITED STATES

Results from study of the earnings of foreign-born workers in the US are presented in Table 8. Most of the variables listed in Table 8 were introduced in Section II, and the definitions and measurements presented there are retained here. The new variable LNWW is the natural logarithm of the number of weeks worked in 1979, and the citizen variable distinguishes immigrants who became US citizens from those who have not. The race variable distinguishes black immigrants from all other racial groups.

Table 8 Column (i) presents results for a conventional specification of the human capital earnings function in which the explanatory variables comprise years of schooling, years of labor market experience and its square, marital status, locality, weeks worked, birthplace, duration of residence and its square, and citizenship. These results are reasonably standard, and only brief comments are provided.

There is a strong positive relationship between earnings and years of schooling. Each extra year of education is associated with 5.0 percent higher earnings, other things the same. This coefficient is low relative to that estimated for the native born (around 7

TABLE 8

REGRESSION ESTIMATES OF EARNINGS EQUATIONS, ADULT FOREIGN-BORN MEN, US 1980
(Dependent Variable: Natural Logarithm of Earnings in 1979)

	Total Sample			Fluent in English		Not Fluent in English	
	OLS (i)	OLS (ii)	IV (iii)	OLS (iv)	Select Crtd (v)	OLS (vi)	Select Crtd (vii)
Constant	4.268	4.197	4.028	4.114	3.918	4.922	4.653
	(58.07)	(57.40)	(59.63)	(46.87)	(38.70)	(27.79)	(17.19)
Education	0.050	0.046	0.037	0.053	0.057	0.015	0.010
	(39.12)	(34.99)	(13.05)	(36.12)	(32.73)	(5.29)	(2.02)
Experience	0.030	0.030	0.033	0.036	0.035	0.012	0.013
	(18.55)	(19.18)	(19.73)	(19.72)	(19.16)	(2.97)	(3.21)
Experience Squared/100	-0.046	-0.046	-0.047	-0.056	-0.056	-0.020	-0.021
	(15.99)	(16.15)	(16.79)	(16.32)	(16.23	(3.17)	(3.20)
Years Since Migration(YSM)	0.023	0.020	0.013	0.018	0.021	0.030	0.025
	(16.19)	(14.02)	(5.71)	(10.77)	(11.28)	(8.30)	(4.86)
YSM Squared/100	-0.043	-0.039	-0.029	-0.033	-0.037	-0.062	-0.056
	(13.52)	(12.23)	(7.25)	(9.32)	(9.91)	(6.31)	(5.20)
LNWW	1.062	1.057	1.046	1.084	1.088	0.969	0.969
	(60.08)	(59.88)	(97.15)	(49.97)	(50.24)	(33.36)	(33.37)
Married	0.207	0.207	0.205	0.222	0.222	0.117	0.116
	(17.64)	(17.62)	(17.76)	(16.80)	(16.86)	(4.62)	(4.54)
Citizen	0.054	0.043	0.016	0.045	0.044	0.030	0.030
	(4.94)	(3.92)	(1.26)	(3.70)	(3.62)	(1.17)	(1.14)
Race (Black)	-0.224	-0.245	-0.297	-0.259	-0.242	-0.136	-0.151
	(9.08)	(9.95)	(10.66)	(10.15)	(9.35)	(1.35)	(1.49)
Rural Location	-0.070	-0.068	-0.065	-0.081	-0.081	-0.056	-0.055
	(3.76)	(3.68)	(3.92)	(3.80)	(3.82)	(1.54)	(1.52)
South	-0.065	-0.065	-0.064	-0.062	-0.061	-0.087	-0.085
	(5.43)	(5.42)	(5.53)	(4.68)	(4.60)	(3.25)	(3.20)
Birthplace:							
Ireland	-0.178	-0.180	-0.186	-0.163	-0.160	(a)	(a)
	(4.14)	(4.21)	(4.05)	(3.81)	(3.70)		
Canada	-0.087	-0.086	-0.085	-0.074	-0.074	(a)	(a)
	(3.15)	(3.14)	(2.98)	(2.69)	(2.72)		

TABLE 8 (continued)

	Total Sample			Fluent in English		Not Fluent in English	
	OLS (i)	OLS (ii)	IV (iii)	OLS (iv)	Select Crtd (v)	OLS (vi)	Select Crtd (vii)
West Indies	-0.157	-0.160	-0.165	-0.126	-0.123	-0.494	-0.463
	(4.14)	(4.20)	(3.98)	(3.30)	(3.22)	(0.92)	(0.86)
Europe	-0.140	-0.126	-0.092	-0.120	-0.131	0.077	0.126
	(6.21)	(5.59)	(3.66)	(5.32)	(5.77)	(0.61)	(0.95)
Vietnam	-0.297	-0.281	-0.242	-0.268	-0.287	-0.125	-0.073
	(6.43)	(6.10)	(4.85)	(5.05)	(5.37)	(0.86)	(0.48)
Philippines	-0.310	-0.310	-0.309	-0.328	-0.326	0.110	0.131
	(10.55)	(10.51)	(9.67)	(10.91)	(10.87)	(0.81)	(0.95)
China	-0.364	-0.332	-0.253	-0.289	-0.315	-0.303	-0.231
	(11.87)	(10.81)	(6.80)	(8.85)	(9.43)	(2.30)	(1.62)
South Asia	-0.144	-0.141	-0.133	-0.159	-0.161	-0.136	-0.128
	(4.29)	(4.19)	(3.94)	(4.69)	(4.77)	(0.65)	(0.62)
Other Asia	-0.244	-0.222	-0.169	-0.218	-0.238	-0.001	0.060
	(7.80)	(7.10)	(5.14)	(6.60)	(7.16)	(0.01)	(0.42)
Mexico	-0.333	-0.286	-0.173	-0.273	-0.319	-0.188	-0.105
	(13.45)	(11.47)	(4.43)	(10.32)	(11.04)	(1.51)	(0.75)
Cuba	-0.325	-0.280	-0.174	-0.263	-0.299	-0.089	-0.002
	(11.31)	(9.77)	(4.26)	(8.72)	(9.51)	(0.68)	(0.02)
Other America	-0.335	-0.308	-0.245	-0.265	-0.288	-0.247	-0.181
	(13.01)	(11.99)	(7.73)	(9.93)	(10.60)	(1.94)	(1.30)
Africa	-0.195	-0.186	-0.165	-0.181	-0.187	-0.142	-0.120
	(5.07)	(4.84)	(4.21)	(4.66)	(4.82)	(0.57)	(0.48)
Middle East	-0.219	-0.213	-0.199	-0.199	-0.203	-0.128	-0.099
	(5.72)	(5.57)	(5.55)	(5.15)	(5.27)	(0.73)	(0.56)
Not Reported	-0.298	-0.281	-0.239	-0.266	-0.279	-0.121	-0.061
	(9.75)	(9.17)	(7.51)	(8.19)	(8.55)	(0.91)	(0.43)
Proficient in English	(a)	0.169	0.571	(a)	(a)	(a)	(a)
		(12.52)	(5.43)				
Lambda	(a)	(a)	(a)	(a)	0.399	(a)	-0.216
					(3.74)		(1.38)
Sample Size	32,255	32,255	32,255	25,713	25,713	6,542	6,542
Adj R^2	.3856	.3886		.3632	.3635	.3176	.3177

TABLE 8 (continued)

Note: 't' statistics in parentheses computed using White's (1980) heteroskedasticity consistent covariance matrix estimator.
(a) variable not entered.

Source: Same as Table 1

percent), but consistent with previous analyses of immigrants' earnings [e.g., Chiswick (1978), Chiswick and Miller, 1988)].

The impact of labor market experience on earnings differs according to whether the experience was accumulated in the country of origin or in the US. The partial effect of labor market experience in the country of origin (EXP) is given by the coefficients on the experience variables. Hence, $\delta \ln EARN/\delta EXP = 0.030-0.0009EXP$. Evaluated at EXP=10 years, this equals 2.1 percent while after twenty years of labor market activity the earnings growth associated with experience is 1.2 percent.

The return to labor market experience in the US comprises the sum of the returns to experience in the country of origin and the differential returns to duration of residence. There is a premium to US labor market experience up to 27 years, though higher levels of US experience are associated with lower earnings growth than that attached to pre-immigration experience. This pattern of effects mirrors the pervasive finding from analyses of various data sets for several countries.

Under the assumption that the cross-section may be used to make longitudinal-type conjectures, the return to experience in the US is given as $\delta \ln EARN/\delta EXPUS=0.053-0.00178EXPUS$. Assuming all labor market activity takes place after migration, then the earnings growth with an additional year of experience is 3.5 percent when evaluated at EXPUS=10, and 1.7 percent when evaluated at EXPUS=20.

There is considerable variation in earnings across birthplace regions. In this analysis, Britain is used as the reference group. Each of the 15 birthplace dichotomous variables is negative and statistically significant, indicating that members of the particular birthplace have earnings lower than immigrants from Britain. The ranking of birthplaces in terms of decreasing earnings advantage is: Canada, Europe, South Asia, Ireland, Middle East, Other Asia, Vietnam, Africa, Philippines, Not Reported, Cuba, Mexico, West Indies, Other America, and China. The estimated coefficients range from -0.09 to -0.38, indicating a percentage earnings differential of between 7 and 32 percent.

The estimating equation (Table 8, column i)shows that married (spouse present) men have earnings considerably higher than those in other marital statuses, that citizens have a small (5 percent) earnings advantage, and that residents of Southern States or of rural areas each have earnings 5 percent lower than residents of other localities, ceteris paribus. Blacks have earnings about 20 percent lower than other racial groups (coeffient- 0.22), even after controlling for schooling and country of origin.

The elasticity of earnings with respect to weeks worked is 1.062, and this is significantly different from one. In other words, full-year workers receive 6 percent higher weekly earnings than part-year workers, ceteris paribus. This may reflect dimensions of human capital accumulation by those with a greater attachment to the labor market not captured by the proxy for labor market experience. It may also reflect the effects of an upward rising labor supply curve (i.e., those with higher wages working more hours) and the positive correlation of hours worked per week and weeks worked per year.

One attribute which has not been accounted for in the Table 8 column (i) specification is knowledge of the English language. This is expected to play a major role in explaining variations in earnings. There is a difference of .611 in the mean logarithmic earnings of foreign-born residents of the US who are fluent in English, and those who have an English language deficiency, implying an earnings differential of around 46 percent. The relatively short period of time those with an English language deficiency have been in the US (10 years versus 17 years), the fewer years of schooling that they possess (8 years versus 13 years), and the fact that they work, on average, 3 weeks per year less than other immigrants who are fluent in English, are factors likely to contribute to the difference in observed earnings.

To isolate the impact on earnings of variables other than English language deficiency, so that the effect of fluency can be estimated, the dichotomous English fluency variable used in Section II is added to the conventional human capital earnings function. Results are presented in column (ii) of Table 8. Individuals who are fluent in English have 16.9 percent higher earnings than other groups, ceteris paribus. This earnings advantage is of the same order of magnitude as that reported by Fishback and Terza(1989) for all workers. As the unadjusted earnings differential was 46 percent, this suggests that differences in measurable endowments account for two-thirds of the observed unadjusted earnings differential between the two levels of fluency.

When the GOODENG variable is included in the estimating equation, there are minor changes to some other coefficients (Table 8, column ii). Several birthplace coefficients fall by moderate amounts (e.g., China by 3 percentage points, Cuba and Mexico by 5 percentage points), and the partial effect of duration of residence in the US is reduced, and is given by $\delta \ln EARN/\delta YSM = 0.020-0.00078YSM$. Evaluated at YSM=10, this yields 1.2 percent, compared to 1.4 percent when GOODENG is excluded from the model. However, while this decline can be noted, it is important to emphasise that even when the language proficiency variable is included in the model, years since migration still exercise a pronounced impact on earnings.[27] This contrasts with the finding reported by McManus et al.(1983), but is consistent with other studies that have examined this feature of the earnings determination model [e.g., Abbott and Beach(1987), Chiswick and Miller(1988), Chiswick(1989)].

A number of other specifications of the earnings equation (not reported here) were estimated which included interaction terms between duration of residence and the human capital variables for years of schooling and experience in the country of origin. Both of these variables were significant and positive. Thus, the earnings growth with years in the US is greater for the better educated than for the less-well educated, and also greater for immigrants possessing greater levels of overseas labor market experience. The interaction terms therefore provide evidence of complementarity between the human capital represented by schooling and years of pre-immigration experience and that represented by the duration of residence variable.

The remainder of Table 8 focuses upon the potential endogeneity of the proficiency in the English language variable. Column (iii) presents results derived using an instrumental variables estimator. The instruments for the GOODENG variable are all the explanatory variables in Table 1, with the identifying instruments being the veteran status, children, foreign marriage and minority language concentration measures. There are a number of differences between the OLS and instrumental variables estimates, and, as would be expected, the most pronounced change occurs in relation to the GOODENG variable. This increases from .169 in the case of estimation using OLS to .571 with the instrumental variables approach. While this is a dramatic change, it is noted that similar changes have been reported elsewhere. In Robinson's(1988) analysis of the 1981 Canadian Census, for example, the coefficient recording the wage premium to bilingualism increased by a factor of 2.5 when an instrumental variables estimator was used instead of OLS.[28] The increase in the wage premium to dominant language fluency is associated with a reduction in the apparent rewards to other (complementary) types of human capital investment such as formal education, labor market experience and years since arrival.

These results are open to a number of interpretations. They could derive from the endogeneity of dominant language attainment in earnings determination and thus indicate that the notion of endogeneity should be treated seriously. Alternatively, the dominant language fluency variable may be measured with considerable random error which results in a downward bias in the OLS estimates compared to the value of 0.571 derived using instrumental variables. If so, the self-reported measures of language fluency in the Census should be viewed with considerable scepticism. Finally, the large difference between the OLS and instrumental variables estimates may reflect, in part, the quality of the instruments available for GOODENG: where the instruments have a low correlation with GOODENG the instrumental variables estimates will be consistent but have a large variance relative to OLS. This caveat to the method should be kept in mind when interpreting the results.

Further evidence on the endogeneity of dominant language attainment in earnings determination is found in Table 8 columns (iv) to (vii). Here the sample is separated according to language proficiency, and separate equations estimated for each language group, with and without a correction for sample selection bias.[29] There are a number of minor differences between the results for the sample of workers who are fluent in English and the results discussed above, with the marginally higher earnings growth associated with both formal education and labor market experience being the most important. The statistical significance of the inverse Mills ratio term (lambda) provides one test of the exogeneity of the language attainment variable. This sample selection term is significant ('t'=3.11) and positive. That is, workers become fluent in

English if their unobservable skills are more highly rewarded when they are fluent.

The equation estimated for the sample reporting an English language deficiency (Table 8, columns vi and vii) has a number of features. The earnings growth associated with both formal education and labor market experience is markedly lower than for comparable workers possessing English-language fluency. This suggests a degree of complementarity between types of human capital skills. However, the premium to labor market experience in the US compared to experience in the country of origin is higher for workers who are not fluent in English. Evaluated at 10 years of residence, for example, the partial effect of years since migration on earnings is 1.2 percentage points for individuals with English language fluency, but 1.8 percentage points for individuals not fluent (see Table 8, columns iv and vi).

The third characteristic of these results is that the earnings differences across birthplace groups is smaller within each of the two broad fluency groups than for the sample as a whole.

Finally, among the immigrants with an English language deficiency, the sample selection term is negative, but statistically insignificant ('t'=1.38). As the lambda variable for this equation is constructed to be negative, the negative sign indicates positive self-selection in this instance. That is, individuals who are not fluent in the dominant language have above average levels of the unobserved skills that determine earnings in the non-fluent language market. This provides further support for the hypothesis that English language fluency is endogenous.

A summary of the exogeneity issue may be provided by pooling the two samples and estimating an equation which includes the two sample selection terms [see Robinson(1989a)]. The F test on the incremental contribution of the two auxiliary regressors is 29.859, which is significant at the 5 percent level. This indicates that exogeneity of the English language fluency variable is rejected.[30]

Thus, we are faced with a consistent set of evidence: Immigrants in the US who are proficient in English have higher earnings than individuals characterised by an English language deficiency, ceteris paribus, and English language fluency appears to be the outcome of a choice process, determined in part by the economic returns from acquiring language skills. Thus, the acquisition of language capital, as with other forms of human capital, is responsive to economic incentives.

C. CANADA

The average annual earnings of immigrant workers in Canada who are fluent in a dominant language are 49 percent higher than the earnings of immigrant workers who lack this skill. Individuals who possess dominant language skills are also relatively well endowed in most other skills that are associated with higher earnings. Their average level of schooling is 11.8 years and their average duration of residence in Canada 19.7 years, compared to the averages of 7.1 and 11.9 years for workers who lack fluency in a dominant language. While workers with a dominant language deficiency have more years of labor market experience (34 compared to 26), two-thirds of this experience was accumulated in the country of origin.

The independent effect on earnings associated with dominant language fluency is analysed in this section using the earnings functions presented in Table 9. These estimates are derived for 25-64 year old foreign-born male workers in the 1 in 50 sample Individual File of the 1981 Census of Canada. The approach followed is similar to that adopted to study earnings determination in the US labor market. Hence, column

(i) present results for a conventional specification of the augmented human capital earnings equation in which the natural logarithm of annual earnings is related to years of schooling, years of labor market experience and its square, marital status, locality, weeks worked, duration of residence and its square, citizenship and birthplace. The general patterns that emerge from this analysis are consistent with those highlighted in the study of the US labor market. Earnings increase more than proportionately with weeks worked-the elasticity of earnings with respect to weeks worked is 1.031. This elasticity coefficient is considerably higher than that reported in earlier studies [Chiswick and Miller (1988), Meng (1988)], but this difference can be linked to the treatment of workers who reported non-positive earnings. When this group is excluded from the analysis the elasticity coefficient drops to 0.917.[31]

Earnings increase by 4.5 percent with each additional year of education, and by 1.6 percent with each additional year of labor market experience in the country of origin (evaluated at EXP=10). Labor market experience in Canada is associated with an earnings premium compared with experience prior to migration. Evaluated at 10 years residence in Canada, the premium is a sizeable 1.7 percent. Even after 20 years of residence in Canada, an extra year of Canadian labor market experience is worth 0.8 percentage points more in earnings than experience in the country of origin.

Region of residence exercises an important influence on earnings. Residents of Census Metropolitan Areas have earnings around 8 percent higher than workers who live outside the major cities. The ranking of immigrants' earnings across provinces is similar to that reported by Chiswick and Miller(1988). Thus, the earnings of residents of Quebec

TABLE 9

REGRESSION ESTIMATES OF EARNINGS EQUATIONS, ADULT FOREIGN-BORN MEN CANADA 1980

(Dependent Variable: Natural Logarithm of Earnings in 1980)

	Total Sample			Fluent in a Dominant Language		Not Fluent in a Dominant Language	
	OLS (i)	OLS (ii)	IV (iii)	OLS (iv)	Select Crtd (v)	OLS (vi)	Select Crtd (vii)
Constant	4.447	4.347	4.105	4.402	4.207	5.011	6.345
	(44.26)	(39.44)	(15.37)	(43.54)	(27.58)	(8.94)	(6.95)
Education	0.045	0.044	0.043	0.045	0.046	-0.014	0.006
	(19.63)	(19.37)	(16.73)	(19.83)	(19.92)	(0.70)	(0.27)
Experience	0.026	0.026	0.026	0.027	0.027	0.012	-0.001
	(10.23)	(10.20)	(10.07)	(10.56)	(10.57)	(0.53)	(0.01)
Experience Squared/100	-0.050	-0.050	-0.048	-0.052	-0.052	-0.025	-0.023
	(10.51)	(10.40)	(9.99)	(10.69)	(10.81)	(0.76)	(0.69)
Years Since Migration(YSM)	0.025	0.024	0.023	0.025	0.026	0.003	0.030
	(8.37)	(8.14)	(7.78)	(8.27)	(8.46)	(0.11)	(1.07)
YSM Squared/100	-0.042	-0.042	-0.04	-0.042	-0.043	-0.024	-0.052
	(6.37)	(6.27)	(6.68)	(6.29)	(6.42)	(0.35)	(0.74)
LNWW	1.031	1.029	1.025	1.036	1.039	0.949	0.988
	(42.64)	(42.54)	(59.87)	(42.30)	(42.29)	(9.02)	(9.28)
Married	0.210	0.211	0.213	0.214	0.212	0.029	0.001
	(11.70)	(11.75)	(12.34)	(11.83)	(11.75)	(0.21)	(0.01)
Citizen	0.071	0.067	0.058	0.065	0.066	0.148	0.153
	(4.12)	(3.89)	(2.98)	(3.74)	(3.79)	(1.25)	(1.30)
CMA	0.077	0.078	0.081	0.080	0.078	-0.121	-0.195
	(4.82)	(4.90)	(5.15)	(4.99)	(4.87)	(0.81)	(1.26)
Province:							
Atlantic	0.038	0.038	0.037	0.039	0.039	-0.101	-0.136
	(0.80)	(0.80)	(0.83)	(0.81)	(0.81)	(0.18)	(0.24)
Quebec	-0.047	-0.049	-0.053	-0.036	-0.034	-0.388	-0.303
	(2.48)	(2.56)	(2.62)	(1.90)	(1.78)	(2.65)	(2.00)
Prairie	0.104	0.103	0.100	0.110	0.112	-0.080	-0.037
	(5.46)	(5.39)	(5.12)	(5.74)	(5.82)	(0.40)	(0.19)
British Columbia	0.115	0.114	0.112	0.110	0.111	0.534	0.572
	(6.36)	(6.31)	(5.97)	(6.03)	(6.10)	(3.35)	(3.60)

TABLE 9 (continued)

	Total Sample			Fluent in a Dominant Language		Not Fluent in a Dominant Language	
	OLS (i)	OLS (ii)	IV (iii)	OLS (iv)	Select Crtd (v)	OLS (vi)	Select Crtd (vii)
Birthplace:							
Ireland	-0.162 (1.61)	-0.162 (1.61)	-0.163 (1.88)	-0.162 (1.61)	-0.162 (1.61)	(b)	(b)
US	-0.123 (3.93)	-0.123 (3.93)	-0.124 (4.02)	-0.124 (3.94)	-0.124 (3.97)	(b)	(b)
West Indies	-0.225 (6.92)	-0.228 (6.99)	-0.234 (6.73)	-0.225 (6.90)	-0.220 (6.76)	0.783 (3.77)	0.816 (3.93)
France	-0.115 (2.51)	-0.114 (2.48)	-0.110 (2.08)	-0.124 (2.70)	-0.125 (2.73)	1.787 (6.92)	1.876 (7.04)
W. Europe	-0.138 (6.35)	-0.136 (6.29)	-0.133 (5.83)	-0.137 (6.33)	-0.139 (6.39)	0.821 (1.34)	1.042 (2.13)
E. Europe	-0.182 (6.86)	-0.182 (6.84)	-0.181 (7.03)	-0.184 (6.88)	-0.184 (6.90)	0.962 (4.62)	1.121 (5.18)
S. Europe	-0.140 (6.86)	-0.133 (6.49)	-0.117 (4.30)	-0.138 (6.73)	-0.148 (6.97)	0.750 (4.26)	0.812 (4.53)
Chinese-Asia	-0.344 (10.16)	-0.332 (9.85)	-0.304 (6.75)	-0.286 (8.41)	-0.301 (8.70)	(a)	(a)
Other Asia	-0.237 (8.95)	-0.237 (8.95)	-0.237 (8.69)	-0.234 (8.86)	-0.234 (8.83)	0.206 (0.75)	0.477 (1.61)
Mexico, South & Central America	-0.296 (6.66)	-0.294 (6.60)	-0.286 (5.90)	-0.291 (6.56)	-0.296 (6.67)	0.484 (1.56)	0.643 (2.05)
Africa	-0.130 (3.73)	-0.131 (3.75)	-0.133 (3.27)	-0.134 (3.82)	-0.132 (3.76)	0.906 (3.06)	1.331 (4.34)
Other	-0.103 (2.67)	-0.103 (2.67)	-0.103 (2.68)	-0.105 (2.73)	-0.106 (2.73)	0.973 (3.64)	1.146 (4.10)
Domin. Language Proficiency	(a)	0.122 (2.43)	0.414 (1.34)	(a)	(a)	(a)	(a)
Lambda	(a)	(a)	(a)	(a)	0.577 (1.71)	(a)	1.160 (1.92)
Sample Size	23,741	23,741	23,741	23,081	23,081	660	660
Adj R^2	.2217	.2220		.2161	.2162	.2131	.2157

TABLE 9 (continued)

Note: 't' statistics in parentheses computed using White's (1980) heteroskedasticity consistent covariance matrix estimator.
(a) variable not entered.
(b) variable not relevant.

Source: Same as Table 5

are 5 percent lower, and the earnings of residents of the Prairie provinces and British Columbia are about 10 percent higher, than the earnings of residents of the other provinces. The earnings disadvantage associated with residence in Quebec among immigrants may explain why immigrants tend to avoid this province.

Country of origin is very important to understanding variation in earnings in the Canadian labor market. Each of the birthplace groups has earnings significantly lower than the earnings of immigrants from Britain, ceteris paribus, although the Irish coefficient is at the margin of significance. The ranking in terms of decreasing earnings is: Britain (the benchmark), Other, France, US, Africa, Western Europe, Southern Europe, Ireland, Eastern Europe, West Indies, Other Asia, Southern and Central America, Chinese-Asia. At the lowest end of the spectrum, the earnings of immigrants from Southern and Central America and Chinese-Asia are around 30 percentage points lower than for the British. The earnings of immigrants from the US are 12 percentage points lower than for the British [see Chiswick and Miller(1988) where it is shown that this is largely a post-1971 phenomenon].

The earnings of immigrants who have become Canadian citizens are 7 percent higher than for non-citizens, other variables the same. This sizeable earnings premium may reflect, in part, the use of citizenship status as a screen for access to higher paying jobs, or the greater motivation and commitment to the Canadian labor market of individuals taking out citizenship.

In Table 9, column (ii) the dominant language proficiency measure is included in the estimating equation. Individuals who are proficient in a dominant language have earnings 12.2 percentage points higher than individuals who lack this skill, other things the same. The inclusion of the dominant language proficiency variable has a negligible impact on all other estimated coefficients. In particular, the partial effect on earnings of years since migration is not affected in any material way (a reduction from 1.7 percentage points to 1.6 percentage points, evaluated at 10 years of residence in Canada). This finding is consistent with the evidence reported in Abbott and Beach(1987) and Chiswick and Miller(1988) for quite different specifications of the language fluency variable. It appears, therefore, that the economic progress of immigrants in Canada reflected in the duration of residence variable derives from a source other than the accumulation of language capital.

The results listed in Table 9, column (iii) are derived using an instrumental variables method of estimation. In this model the foreign marriage and minority language concentration measures are used as the identifying instruments for the dominant language proficiency variable. The comparison between the OLS and instrumental variables coefficients in Table 9 is similar to that established for the US data. Hence, the coefficient on the dominant language proficiency variable increases threefold. In this case, however, it is statistically insignificant. In the US study, the variable was highly significant in the instrumental variables model ('t'=5.43). This difference may indicate that the problems of errors in variables and endogeneity are less serious in the analysis for Canada, where the language question is less subjective (see Appendix A) and the level of dominant language fluency considerably higher. However, the finding could simply be associated with the identifying instruments being less suitable in the analysis of earnings determination in Canada than in the same model applied to the US labor market. In the US labor market, the coefficient of determination (adjusted R^2) in the model of dominant language fluency was .37 (see Table 1). For the study of Canada, however, the coefficent of dtermination is only .12 (see Table 5). As there is an inverse relationship between the asymptotic variance of the instrumental variables estimator and the asymptotic correlation between the instruments and the variable instrumented, the application of instrumental variables to the Canadian data would be expected to be less successful than for the US.

The application of the control function method [Table 9, columns (iv) to (vii)] yields results which are more consistent with the findings reported previously for the US. Columns (iv) and (v) list estimates of earnings equations for the portion of the sample reporting that they are fluent in a dominant language, while columns (vi) and (vii) list estimates for immigrants characterised by a self-reported dominant-language speaking deficiency. Both OLS and selectivity corrected estimates are presented.

Individuals who are fluent in a dominant language comprise 97 percent of the total sample. Consequently, the OLS estimates for this group do not differ appreciably from those listed for the total sample. The coefficient on the sample selectivity correction term is positive, and at the margin of statistical significance ('t'=1.71). Thus, there is some, albeit not overwhelming, evidence that the sample of dominant-language speakers is non-random. The high representation of this group in the total sample (97 percent) may have an important bearing on this outcome. Correction for sample selectivity does not affect the estimated coefficients in the model.

Columns (vi) and (vii) in Table 9 list results for the portion of the sample that lacks fluency in a dominant language. The sample here is relatively small (660 observations), and the human capital variables (education, pre- and post-immigration labor market experience) are statistically insignificant. There is, however, considerable variation in earnings across birthplace groups. Because the British birthplace group is not represented in this sample, the Chinese-Asia birthplace region is used as the benchmark. Compared to this group, all birthplace regions except Other Asia, Southern and Central America and Western Europe have higher earnings. The selectivity correction term (lambda) is positive and has a 't' of 1.92. This provides support for the hypothesis of endogeneity of language skills in the model of earnings determination. Correction for sample selection does not affect the other coefficients, but is associated with a widening of the earnings differences across birthplace groups; all birthplace variables other than for Other Asia are significant once the non-random nature of the sample is taken into account.

The evidence contained in Table 9, while not as conclusive as with the study of the US labor market, points to dominant language fluency being determined within the model of earnings determination. Further evidence to this effect is provided by the estimation of pooled equations for the two language groups that contain both sample selection correction terms used in the analyses discussed above. In this experiment the F test on the incremental contribution of the lambda terms was 7.327, which is statistically significant. Hence this summary measure of the endogeneity issue suggests that it is imporant. Consistent with this finding, the Addison and Portugal(1989) test returned a F statistic of 10.882.[32]

D. US-CANADIAN COMPARISONS

The main feature of the comparative study of the determinants of earnings among immigrants in Canada and the US is the overwhelming similarity of the findings, as summarized in Table 10.

In both of the North American labor markets the earnings growth associated with extra years of school is around 4.5 percent. The increase in earnings associated with labor market experience differs according to whether the experience was accumulated in the country of origin or in the destination labor market. An extra year of labor market experience results in about 2 percent higher earnings (evaluated at experience of 10 years) if the experience was accumulated in the country of origin, and 3.3 percent higher earnings if it was accumulated in the destination. Citizens earn more than non-citizens in each country. Although the US and Canadian labor markets are contiguous, the similarity of these effects in the earnings model is remarkable.

Individuals who are proficient in the dominant language in the US have earnings 16.9 percent higher than those who lack this skill. In Canada, however, the earnings premium associated with dominant language fluency is only 12.2 percent. This difference is not statistically significant. When earnings equations are estimated for the US using the "Canadian definition" of dominant language fluency, the earnings premium associated with language skills in the US is 12.7 percent. However, when the instrumental variables approach is used the effects of dominant language fluency are 57.1 percent and 41.4 percent for the US and Canadian labor markets, respectively, but the coefficient is less statistically reliable in the Canadian analysis.

TABLE 10

PARTIAL EFFECTS ON EARNINGS OF SELECTED VARIABLES, US AND CANADA

Variable	**US**	**Canada**
Education	0.046	0.044
Experience in Origin[a]	0.021	0.016
Experience in Origin[b]	0.012	0.006
Experience in Destination[a]	0.033	0.032
Experience in Destination[b]	0.016	0.013
Weeks Worked	1.057	1.029
Married	0.207	0.211
Citizen	0.043	0.067
Proficiency in Dominant Language(s)	0.169	0.122
Proficiency in Dominant Language(s) Canadian Definition for the U.S.	0.127	0.122

(a) = Evaluated at experience of 10 years.
(b) = Evaluated at experience of 20 years.

Source: Tables 8 [column (ii)] and 9 [column (ii)].

IV. SUMMARY AND CONCLUSIONS

This paper has explored the determinants and labor market implications for immigrants of proficiency in speaking the dominant language in the country of destination. The statistical analysis uses the microdata files on adult foreign-born men in the 1980 and 1981 Censuses of the US and Canada, respectively. The languages treated as dominant are English in the US and English and French in Canada. The analyses are based on the self-reported responses to questions on spoken language fluency.

The findings in the analysis of the determinants of language proficiency for the United States and Canada are remarkably similar, and the findings are similar when the analysis is done separately by country of origin of the immigrants. It is shown that in both countries dominant language fluency varies systematically with human capital, demographic and economic variables. Language skills are shown to be determined endogenously with earnings.

Dominant language fluency can be viewed as being "produced" by the individual. This process is more efficient the greater the exposure to the dominant language prior to immigration and the younger the age at immigration, apparently because younger people are more efficient in creating language capital. Greater fluency is also achieved by those who have more schooling, presumably because of the complementarity of various types of human capital. However, the advantageous position of those with more schooling diminishes, but does not disappear, with a longer duration of residence.

Learning by doing is particularly important for language skills and a longer duration in the destination enhances fluency. The effect of duration of residence on language skills in larger for those who immigrate at an older age and for those with less schooling. In general, immigrants with the poorest fluency at arrival undergo the most rapid improvement with experience in the destination.

Family characteristics also appear to matter. Those who are less likely to speak the dominant language at home (e.g., because their spouse speaks the same non-dominant language and there are no children in the household) have lower levels of fluency.

A very important determinant of dominant language proficiency is the extent to which others in the area in which the respondent lives speak the same non-dominant language. That is, immigrants living in communities where their non-dominant language of origin is spoken with greater frequency have a lower level of fluency in the dominant language. However, the adverse effect of a language enclave is not neutral. It is more intense during the initial years in the destination, for less well-educated immigrants, and for those who immigrated as adults. These are the very immigrants with the lowest level of language fluency.

The statistical analysis of earnings in the two countries uses as the starting point the standard human capital earnings function augmented for immigrant analyses. A dichotomous variable for being fluent in the dominant language is then added to the analysis. Yet the self-reported language variable may be subject to much random measurement error and language fluency may be determined endogenously with earnings. That is, those who have a greater economic incentive to acquire fluency in the dominant language may have a higher degree of fluency. As a result, the analysis explores alternative statistical methodologies for the two countries, including ordinary least squares, instrumental variables, and sample selectivity techniques.

The determinants of earnings among immigrants are remarkably similar in the US and Canada; it is as if there is one earnings determination process for the two countries. Using the ordinary least squares methodology those who speak English well or very well have 17 percent higher earnings than those with lesser fluency, while in Canada those who can carry on a conversation in English or French have 12 percent higher earnings than those who cannot. Converting the US data to a close approximation of the less satisfactory Canadian definition, those who are fluent in English also have 12 percent higher earnings. The instrumental variables approach indicates an even larger effect of dominant language fluency, about 50 percent.

The sample selectivity test addresses the issue of the endogeneity of fluency. The test indicates that workers are more likely to become fluent in the dominant language if their unobservable characteristics are more highly rewarded when they are fluent. Thus, the acquisition of language capital appears to be responsive to the economic incentives for acquiring language skills.

The addition of the language proficiency variable to the earnings equation, whether using the observed value or an instrumental variables approach, has little effect on the size or statistical significance of the coefficients for the other variables in the analysis. In the instrumental variables analysis there is, however, a diminution in the partial effect of duration of residence, an important determinant of language fluency, but it remains large and highly significant.

The analysis demonstrates that spoken dominant language proficiency is an important determinant of earnings, and presumably other measures of economic success among immigrants. This suggests the importance of selecting immigrants who have, or who can be expected to quickly acquire, this proficiency if the successful economic adjustment of immigrants is an important policy objective.

Canadian immigration policy explicitly recognizes the importance of this issue by awarding points in their point system for English/French fluency. Current US immigration policy ignores language skills. Even the language requirements for illegal aliens to obtain permanent amnesty under the provisions of the 1986 Immigration Reform and Control Act are so meaningless as to be useless.

The analysis demonstrates the potential counter-productive nature of efforts to shelter immigrants from the economic consequences of inadequate proficiency. Immigrants respond positively to the economic incentives for fluency, thereby making the investment and becoming fluent. The analysis also demonstrates the importance of schooling, age at immigration, country of origin and other variables in determining fluency. These findings need to be explicitly recognized in immigration policy and in resettlement policy. Again, the Canadians seem to have done a better job in this regard than the Americans.

Another important conclusion of this study is with regard to the questions asked in the Census. The language-related questions in the 1980 US Census are superior to those in the 1981 Canadian Census. In the U.S. data individuals who speak a language other than or in addition to English at home are asked to report the non-English language and the degree of their spoken fluency in English on a four point scale ("very well", "well", "not well", "not at all"). In the Canadian data, however, only those who cannot carry on a conversation in English or French are identified, these are the equivalent of the "not at all" English speakers in the U.S. Furthermore, instead of the long list of non-English languages and countries of birth as provided in the US data, the Canadian Census data permit the specific identification of only a handful. This coarseness in the Canadian data hampers the analysis of language. Both countries are repeating their language questions in the 1990/1991 Censuses.

On a final note--the knowledge that dominant language skills are very important for the economic success of immigrants for two countries with different immigration policies suggests the fundamental role of language capital in the labor market. In general language capital is too obvious to be noticed. Immigration research highlights its role. This research also suggests that even among the native born fluency is important and degrees of fluency, not discerned in current data, may be important determinants of economic attainment.

FOOTNOTES

1. The biblical account of the Tower of Babel is instructive. According to tradition all people spoke the same language and gathered at Babel to work together to construct a tower to reach Heaven. Offended by this the Lord inflicted on the people a diversity of languages, thereby increasing transaction costs, and halting the progress of the tower.

2. The language questions contained in the Census questionnaires are reproduced in Appendix A.

3. The co-authors of this paper, for example, disagree on the spelling of labor (or is it labour).

4. Perhaps the classic example is the myth, perhaps not too far from reality, that Jewish immigrant parents in Israel learned Hebrew from their children.

5. The equations were also estimated using a logit model. The signs and significance of the estimates were broadly similar for the two methods of estimation.

6. Diagnostic testing using the Breusch-Pagan(1979) test suggested that the residuals were not homoskedastic, and all 't' values for the linear probability model have been calculated using White's(1980) heteroskedasticity-consistent covariance matrix estimator.

7. Tests were conducted to determine whether the relationship between English-language fluency and educational attainment was non-linear.

We did not achieve any gain in economic insights from attempting to capture this non-linearity through the use of complex functional forms for education (e.g., higher order polynomials, linear splines, or a large number of dummy variables). Accordingly, a simple linear education variable is used.

8. Equations were also estimated with a second-degree polynomial in age. However, the squared term was not significant at conventional levels.

9. For older cohorts of immigrants (pre 1945), there is a negative partial effect of duration of residence on language skills. Most pre-1945 immigrants in these data arrived during the 1930s, and a disproportionate number were young-adult refugees who may not have been self-selected for acquiring US-specific skills and may have anticipated returning to Europe after the fall of fascism.

10. Those not fluent in English may have access to a much smaller marriage market and may be less likely to marry. This reverse causation argument would be more compelling for numerically small groups. Yet the same effect appears among a very large group, Mexican immigrants.

11. There is some degree of endogeneity in the Veteran Status variable, although this would be less intense during the period of conscription.

12. The children variables record the presence in the household of children less than 18 years of age at the time of census enumeration. Ideally we would like to use information on the number and ages of all children ever in the household in the United States, and not only those currently living at home.

13. Spanish is spoken in the home by 10 percent or more of the population in California, Texas, Arizona and New Mexico. For further information on home language usage in the various states, see Appendix Table 3.

14. Among immigrants from Mexico, the anglicization process continues for about the same time period as reported for the Table 1 results. This suggests that the differences in conclusions drawn from Table 1 and Veltman(1988) derive mainly from the different methodologies employed. The Table 3 finding is similar to that reported by Grenier and Vaillancourt(1983), also on the basis of a multivariate analysis.

15. The minority language coefficient is -0.014 in Table 1. In Table 3 the within-birthplace region estimates of the minority language coefficients are within two standard errors of that estimate for Other Asia, Mexico, Other America and Africa. While this is not a valid statistical test because the coefficients are not estimated independently, it does strengthen the point that the Table 1 minority language effect is more than merely a proxy for country of origin.

16. The Census reports all Chinese dialects as one category, a practice followed here. Although they share a common written language, the differences in the spoken language among the Chinese dialects is so great that it is as if they were different languages. The minority language variable is positive and significant for those from South Asia, but less than 2 percent of this sample (20 cases) is not fluent in English.

17. It is, however, positive and significant for the small sample of immigrants from Africa. The reasons for this unexpected result are,

as yet, unclear. The small sample of Africans is heterogenous: 33 percent are white North Africans, 19 percent are white South Africans, 38 percent are black and 10 percent are other Africans.

18. When only those who report that they cannot speak English at all are considered as lacking in English fluency, the fluency rate increases to 95 percent in the US Census data.

19. There are 9 factors in the selection procedure, and the maximum points they carry are: Education (12 points), Special Vocational Preparation (15), Experience (8), Occupation (10), Arranged Employment (10), Demographic Factors (10), Age (10), Knowledge of Official Languages (15), Personal Suitability (10). Thus, of the 100 points in the assessment procedure, 15 are allocated to knowledge (speaking, reading, and writing) of the official languages. The passmark varies by category of immigrant. It is 70 for independent workers, 55 for assisted relatives and 25 for entrepreneurs. Further details can be obtained from: Immigration Manual: Selection and Control, Section 4.08, Employment and Immigration Canada.

20. Direct information on the language skills of children is available in the Family File, and it is possible that this would provide the opportunity to ascertain more definitely whether there is a relationship between the use of dominant language in the home by children and adult dominant language. When a variable for children's dominant language use within the home was included in the estimating equation, it was highly significant. This suggests that adults' dominant language fluency is higher in families where children speak the dominant language. However, in view of the statistical

insignificance of the children variables, the direction of causation here is very problematic, and little weight can be attached to this result.

21. There is, of course, possible endogeneity; those not fluent in the dominant language may be less successful in the marriage market for dominant-language speakers. However, as was found for the US, pre-migration marriage has a larger adverse impact on fluency compared to post-migration marriage among those country groups with the largest ethnic marriage market in the destination, that is, among those most likely to find a spouse in the destination who also speaks the same non-dominant language.

22. This positive effect arises even though schooling and language fluency are alternative sources for points in the immigrant rationing system.

23. When the equation was re-estimated using a logit model, this anomaly disappeared.

24. This compares with the impact of -0.010 ('t'=4.14) attributed to this variable on the basis of analysis of the Household/Family File. Using more detailed information in the construction of this variable therefore appears to be associated with a stronger estimated impact.

25. As noted previously, if only those who reported that they spoke English "Not at all" are considered as lacking English-language fluency, the US fluency rate is 95 percent.

26. These methods have recently been investigated is some depth in the union wage effects literature [see Robinson(1989a)(1989b), Addison and Portugal(1989)]. Both methods are used in this paper. A simultaneous equations system in which earnings and language are both endogenous cannot be estimated because of the absence of instruments that enter an equation for earnings but not for language. While weeks worked might seem to be one such variable, it largely standardizes annual earnings for the amount of time worked. The citizen and race variables are also inappropriate as citizenship may be determined endogenously with language skills, and the race variable is highly collinear with the country of birth variables.

27. Recall also that duration of residence is an important determinant of language proficiency.

28. This result is consistent with that in the union wage effects literature where, according to Robinson (1989, p.658), there is "substantial evidence of a consistent rise in the union differential relative to OLS estimates when the endogeneity of union status is addressed by the instrumental variables or inverse Mills ratio method".

29. The selectivity correction factors are computed for logit estimates of the language attainment model developed in Section II. The method outlined in Lee (1983) is applied.

30. This finding concerning the assumption of exogeneity of the language fluency variable is supported by results of an alternative test based on the Hausman (1978) test as outlined in Addison and Portugal(1989).

For this procedure the computed value of the test statistic was 17.687, which exceeds the critical F value at the 5 percent level of significance.

31. Differences between the Table 9 results and those presented in Chiswick and Miller (1988) are due to different treatment in the analyses of workers with non-positive incomes. In Chiswick and Miller(1988), these individuals were purged from the sample, and the results obtained are consistent with the Canadian literature. In the present analysis, this small group of workers (2 percent of the sample) are assigned $100 in earnings. The results obtained are very similar to those reported in the US literature where the same procedure is used.

32. The estimates for the Addison and Portugal(1989) test differ from the instrumental variables estimates discussed previously in that a logit model is used to predict dominant language fluency in preference to the linear probability model, and interaction terms with dominant language proficiency are included in the estimating equation.

APPENDIX A

THE CENSUS LANGUAGE QUESTIONS

United States: 1980 Census

13a. Does this person speak a language other than English at home?

o Yes
o No, only speaks English (skip to 14)

b. What is this language?

(For example-Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?

o Very Well
o Well
o Not Well
o Not at all.

Note: The respondents were instructed to report "yes" to Q.13a if a language other than English is spoken at home, even if English is spoken more frequently than the other language. Those who speak only English at home include those who may speak another language at school, work or elsewhere, but not at home, and those whose usage of another language at home is limited to a few expressions or slang.

For those speaking two or more non-English languages at home the respondent was asked to report the language spoken most often, or if this could not be determined, the first language learned. The write-in entries were coded into 387 language categories.

Source: US Bureau of the Census, Census of Population and Housing, 1980: Public Use Microdata Sample, Technical Documentation, Washington, D.C., 1983, pp. K26 and K65.

Canada: 1981 Census   Form 3: Individual Census Questionnaire

Question 12.
What is the language you first learned in childhood and still understand?

|____|English

|____|French

|____|German

|____|Italian

|____|Ukrainian

|____|Other (specify)

Question 18.

What language do you yourself speak at home now?
(If more than one language, which language do you speak most often?)
Mark one box only

- ☐ English
- ☐ French
- ☐ German
- ☐ Italian
- ☐ Ukrainian
- ☐ Other (specify)

Question 19.
Can you speak English or French well enough to conduct a conversation?
Mark one box only

- ☐ English only
- ☐ French only
- ☐ Both English and French
- ☐ Neither English nor French

Note: The responses to "Other", specified in Q.12 and Q.18, were coded and reported in the Household/Family File as Chinese and Other, whereas Chinese, Greek, Netherlandic languages, Polish and Portuguese are identified as separate languages in the Individual File.

Source: Statistics Canada, *Summary Guide, Total Population*, Catalogue No. 99-902.

APPENDIX B

The variables used in the analysis are defined below. Mnemonic names are also listed where relevant.

Analysis of 1980 US Census of Population:

Definition of Population: Foreign-born men aged 25 to 64 who worked during 1979.

Earnings (LNEARN): The natural logarithm of the sum of wage or salary income and self employment income (either non-farm or farm). Income data refer to 1979.

Weeks Worked (LNWW): The natural logarithm of the number of weeks the respondent worked in 1979.

Years of Education (EDUC): This variable records the total years of full-time education.

Years of Experience (EXP): This is computed as age minus years of education minus 5 (i.e., EXP=AGE-EDUC-5). A quadratic specification is used.

Years Since Migration (YSM): The categorical Census information on year of migration is converted to a continuous measure using the following values: 1975-80=2 years, 1970-74=7 years, 1965-69=12 years, 1960-64=17 years, 1951-1959=24.5 years, prior to 1950=40 years. A quadratic specification is used for this variable.

Birthplace (BIRTH): A number of birthplace regions were considered in the analyses: Britain, Ireland, Other Europe, Canada, West Indies, Mexico, Cuba, Other America, China, Philippines, Vietnam, South Asia (which comprises the regions of British influence, namely India, Pakistan, Sri Lanaka, Bangladesh, Bhutan and Nepal), Other Asia (e.g., Korea, Japan, etc.), Middle East, Africa,
and Non-Reported. For the study of language proficiency, immigrants from Britain, Ireland, Canada, Australia, New Zealand and the West Indies comprise the omitted English-speaking category, whereas for the study of earnings, the omitted category is restricted to immigrants from Britain.

English Language Proficiency (GOODENG): GOODENG is set to one for individuals who speak only English at home, or if a language other than English is spoken in the home, speak English either "very well" or "well". The GOODENG variable is set to zero where a language other than English is spoken in the home and the respondent speaks English either "not well" or "not at all".

Citizenship (CITIZEN): This is a dichotomous variable, set to one for individuals who were either born in the US or outlying area, naturalised, or born abroad of American parents.

Minority Group Concentration (CONC): Each respondent is assigned a measure equal to the percentage of the population aged 18 to 64 in the state in which he lives which reports the same non-English language group as the respondent. In the construction of this variable only the 20 largest nationwide language groups are recognized. In descending order, these are: Spanish, Italian, German, French, Polish, Chinese, Tagalog, Greek, Portuguese, Japanese, Yiddish, Korean, Arabic, Vietnamese, Hungarian, Russian, Dutch, Hindi, Ukranian, Czech. These constitute 92 percent of all valid responses. Representation in the other language groups is so small numerically that the proportions are approximately zero, and this value is assigned. Those who reported only English are also assigned a zero value. Appendix Table 3 presents data on the percentage representation in the eight largest language groups for each state.

Marital Status (MARRIED): This is a binary variable which distinguishes between individuals who are currently married, spouse present (equal to 1) and all other marital states.

Married Overseas (FORMAR): This variable is defined only for the foreign born who have been married only once. It is constructed from information on age at first marriage and age at arrival in the US. Individuals currently in their first marriage for whom age at first marriage is less than age at arrival in the US are assumed to have married in the country of origin. The variable is zero for all other individuals.

Children: Three variables are included in the estimating equations. The first records whether one or more children aged less than 6 years were living in the family, and there were no older children. The second records whether one or more children aged between 6 and 17 years inclusive were living in the family, and there were no younger children. The third variable records the presence of children aged less than six years and between 6 and 17 years.

Veteran Status (VETSTAT): This is a dichotomous variable, set to one where the respondent is a veteran of the US Armed Forces, otherwise it is set to zero.

Location: The two location variables record residence of a rural area (Rural) or of the South Atlantic, East-South Central or West-South Central geographic divisions (South). These variables are not mutually exclusive.

Race: This is a dichotomous variable, set to one if the individual is a member of the Black racial group, and set to zero for all other racial groups (White, Asian and Pacific Islander groups, other groups).

Note: All variables for the US are dichotomous except earnings, education, total experience, duration in the destination, weeks worked, and minority language group concentration.

Analysis of 1981 Canadian Census:

Definition of Population: Foreign-born men aged 25 to 64 who worked during 1980.

Earnings (LNEARN): The natural logarithm of the sum of wage or salary income and self employment income. Income data refer to 1980.

Weeks Worked (LNWW): The natural logarithm of the number of weeks worked by the respondent in 1980.

Years of Education: This variable records the total years of full-time education.

Years of Experience (EXP): This is computed as age minus years of education minus 5 (i.e., EXP=AGE-EDUC-5). A quadratic specification is employed.

Years Since Migration (YSM): The Census information on year of arrival in Canada is recorded in individual years between 1971 and 1980, and in intervals of varying length for pre-1971 arrivals. The categorical information was converted to a continuous measure of years since migration using the following values: 1967-70=12.5 years, 1966=15 years, 1961-65=18 years, 1956-60=23 years, 1946-55=30.5 years, and pre 1946=42 years. A quadratic specification is employed.

Birthplace (BIRTH): Previous studies [e.g., Meng(1987), Chiswick and Miller(1988)] have proposed a range of birthplace groupings for inclusion in models of earnings determination. In the present study we use a set of birthplace regions that facilitates comparisons with the study of the US labor market. The following birthplace groups are recognised in this study: Britain, Republic of Ireland, US, France, Western Europe (which includes Belgium, Luxembourg, West Germany, the Netherlands and Austria), Southern Europe (which includes Greece, Italy, Portugal and Yugoslavia), Eastern Europe (which includes Hungary, Poland, the USSR and Czechoslovakia), Chinese-Asia, Other Asia, South and Central America, English-origin West Indies, Africa and Other. These regions are distinguished with reference to the birthplace, ethnic origin and mother tongue information in the Census Files. Mother tongue is used to separate immigrants from Southern and Central America from English-origin immigrants from the Caribbean. Ethnic origin is used to allocate some of the responses to birthplace coded as "Other Europe" to the categories of Northern and Western Europe, Southern Europe and Eastern Europe, and also to distinguish Chinese-Asia from other regions of Asia. For the study of dominant language proficiency, immigrants from Britain, Ireland, US and the British West Indies comprise the omitted dominant-language speaking category, while for the study of earnings, the omitted category is restricted to immigrants from Britain.

Dominant Language Proficiency (GOODLANG): Individuals who reported that they could speak English or French well enough to conduct a conversation were classified as proficient in the dominant language.

Minority Group Concentration (CONC): Each respondent is assigned a measure equal to the percentage of the population aged 18 to 64 in the region (defined using information on residence in a Census Metropolitan Area and province of residence) in which he lives that reports the same home language as the respondent. In the construction of this variable the non-dominant language groups Chinese, German, Italian and Ukrainian are used for analyses based on the Household/Family File, and Chinese, German, Italian, Ukrainian, Greek, Netherlandic languages, Polish and Portuguese for analyses based on the Individual File. The first four language groups constitute 46 percent of non-dominant language responses, and the final four a further 20 percent. Appendix Table 4 presents data on the percentage representation in each language group for the 23 regions distinguished in the construction of the variable.

Marital Status (MARRIED): This is a binary variable which distinguishes between individuals who are married, spouse present (equal to 1) and all other marital states.

Married Overseas (FORMAR): The construction of this variable parallels that of the foreign marriage variable included in the analyses of the 1980 US Census of Population. It is computed from information on age at first marriage and age at arrival in Canada. Individuals for whom age at first marriage is less than age at arrival in Canada, and for whom the date of marriage corresponds to that of their spouse, are assumed to have married their present spouse in the country of origin.

Location: Two location variables are used in the study. The first records province of residence. This information was grouped as follows: Ontario, Atlantic povinces (Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island), Quebec, Prairie provinces (Manitoba, Saskatchewan, Alberta) and British Columbia. The second locality variable records the size of the place of residence. Here, individuals residing in Census Metropolitan Areas (defined as a place having 100,000 or more population) are distinguished from other individuals.

Citizenship (CITIZEN): Individuals who hold Canadian citizenship are distinguished from immigrants who have not yet become Canadian citizens. This information is available only from the Individual File.

Note: All variables for Canada are dichotomous except earnings, education, total experience, duration in the destination, weeks worked, and minority language group concentration.

APPENDIX TABLE 1

MEANS AND STANDARD DEVIATIONS OF VARIABLES BY REGION OF ORIGIN FOR ADULT FOREIGN-BORN MEN, UNITED STATES, 1980.

	Total Sample		Country of Origin			
			English-Speaking		non-English Speaking	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Education	11.981	4.949	13.174	3.598	11.792	5.104
Age	41.108	11.007	44.049	11.493	40.539	10.851
Experience	24.038	12.539	25.876	12.680	23.748	12.492
YSM	15.751	11.994	20.033	13.213	15.074	11.647
Married	0.807	0.394	0.802	0.398	0.808	0.394
Married Overseas	0.360	0.480	0.330	0.470	0.365	0.481
Child < 6 only	0.144	0.351	0.101	0.301	0.150	0.357
Child 6-17 only	0.277	0.448	0.294	0.456	0.275	0.446
Children < 6 & 6-17	0.137	0.344	0.085	0.279	0.145	0.352
Veteran	0.167	0.373	0.237	0.425	0.156	0.363
Rural Location	0.078	0.269	0.125	0.331	0.071	0.257
South	0.194	0.396	0.163	0.369	0.199	0.399
Minority Concent.	3.808	5.781	0.262	1.305	4.368	6.012
Citizenship	0.482	0.500	0.540	0.498	0.473	0.499
Birthplace:						
Britain	0.039	0.194	0.292	0.455	(a)	
Canada	0.060	0.237	0.437	0.496	(a)	
Ireland	0.012	0.108	0.086	0.281	(a)	
West Indies	0.025	0.157	0.185	0.388	(a)	
Europe	0.278	0.448	(a)		0.322	0.467
Vietnam	0.010	0.101	(a)		0.012	0.109
Philippines	0.037	0.188	(a)		0.042	0.202
China	0.040	0.196	(a)		0.046	0.210
South Asia	0.031	0.174	(a)		0.036	0.187
Other Asia	0.049	0.216	(a)		0.057	0.231
Mexico	0.174	0.379	(a)		0.201	0.401
Cuba	0.051	0.220	(a)		0.059	0.236
Other America	0.097	0.296	(a)		0.112	0.315
Africa	0.021	0.143	(a)		0.024	0.153
Middle East	0.025	0.156	(a)		0.029	0.167
Not Reported	0.051	0.220	(a)		0.059	0.236
Earnings	17,279	16,559	21,362	19,161	16,633	16,015
log(earnings)	9.391	0.991	9.639	0.939	9.351	0.994
Weeks Worked	46.405	10.893	47.468	10.005	46.237	11.018
Log(weeks worked)	3.779	0.431	3.811	0.399	3.774	0.436
GOODENG	0.797	0.402	0.992	0.088	0.766	0.423
Sample Size	32,255		4,405		27,850	

Note: (a)=variable not relevant.

The English-speaking regions include Britain, Canada, Ireland and the British West Indies.

Source: same as Table 1.

APPENDIX TABLE 2

MEANS AND STANDARD DEVIATIONS OF VARIABLES BY REGION OF ORIGIN FOR ADULT FOREIGN-BORN MEN, CANADA, 1981.

	Total Sample		Country of Origin: Dominant Language		Country of Origin: Non-Dominant Language	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Education	11.689	3.851	12.950	3.220	11.090	3.979
Age	42.645	10.542	42.724	10.738	42.608	10.447
Experience	25.956	12.035	24.773	11.706	26.518	12.149
YSM	19.452	10.626	19.725	11.344	19.323	10.266
Married	0.827	0.378	0.814	0.389	0.833	0.373
Married Overseas	0.272	0.445	0.280	0.449	0.269	0.443
Child < 6 only	0.129	0.335	0.108	0.311	0.138	0.345
Child 6-17 only	0.430	0.495	0.410	0.492	0.444	0.497
Children < 6 & 6-17	0.112	0.315	0.091	0.288	0.122	0.327
Metropolitan (CMA)	0.744	0.436	0.694	0.461	0.768	0.422
Atlantic Province	0.021	0.145	0.041	0.198	0.012	0.110
Prairie Provinces	0.139	0.346	0.134	0.341	0.142	0.349
Quebec	0.143	0.350	0.105	0.306	0.161	0.367
British Columbia	0.159	0.365	0.181	0.385	0.148	0.355
Minority Concent.	0.540	1.395	0.009	0.174	0.793	1.631
Citizenship	0.743	0.437	0.679	0.467	0.773	0.419
Birthplace:						
Britain	0.200	0.400	0.621	0.485	(a)	
US	0.056	0.230	0.174	0.379	(a)	
Ireland	0.005	0.073	0.017	0.128	(a)	
West Indies	0.044	0.206	0.137	0.344	(a)	
France	0.016	0.127	0.051	0.220	(a)	
W. Europe	0.137	0.344	(a)		0.202	0.401
E. Europe	0.094	0.292	(a)		0.139	0.345
S. Europe	0.232	0.422	(a)		0.342	0.475
Chinese-Asia	0.048	0.213	(a)		0.070	0.256
Other Asia	0.086	0.280	(a)		0.127	0.333
Africa	0.030	0.170	(a)		0.044	0.204
S. & C. America	0.020	0.141	(a)		0.030	0.170
Other	0.032	0.175	(a)		0.047	0.211
Earnings	20,218	13,391	22,797	14,427	18,991	12,687
log(earnings)	9.595	1.096	9.752	1.009	9.521	1.128
Weeks Worked	46.472	10.446	47.471	9.607	45.996	10.789
Log(weeks worked)	3.789	0.391	3.819	0.352	3.774	0.408
GOODLANG	0.972	0.164	1.000	0.016	0.959	0.198
Sample Size	23,741		7,649		16,092	

(a) = variable not relevant.

Note: The dominant language regions include Britain, US, Ireland, France and the British West Indies.

Source: 1981 Census of Canada, Public Use Sample, Individual File, 1/50 Sample of the Foreign born [except the children variables which are derived from the Household/Family File].

APPENDIX TABLE 3

PERCENTAGE REPRESENTATION OF MAJOR MINORITY LANGUAGE GROUPS BY STATE US, 1980[a]

State[b]	Language Spanish	Italian	German	French	Polish	Chinese	Tagalog	Greek
Alabama	0.40	0.03	0.18	0.38	0.00	0.05	0.03	0.10
Alaska-Hawaii	1.72	0.07	0.79	0.22	0.14	1.08	3.66	0.00
Arizona[b]	17.82	0.20	0.43	0.18	0.18	0.23	0.00	0.13
Arkansas	0.30	0.00	0.17	0.08	0.04	0.04	0.04	0.00
California	13.97	0.47	0.71	0.38	0.08	1.08	0.92	0.13
Colorado	6.69	0.27	1.09	0.61	0.10	0.27	0.00	0.00
Connecticut	3.35	2.90	0.73	2.33	1.37	0.13	0.10	0.32
Columbia	2.61	0.33	0.65	1.79	0.00	0.65	0.16	0.65
Florida	8.48	0.66	0.83	0.71	0.22	0.06	0.10	0.15
Georgia	0.68	0.11	0.34	0.41	0.05	0.02	0.00	0.13
Illinois	5.02	0.80	0.87	0.31	1.20	0.24	0.20	0.42
Indiana	1.41	0.04	0.75	0.26	0.33	0.04	0.02	0.07
Kentucky	0.47	0.11	0.28	0.28	0.00	0.00	0.03	0.03
Louisiana	1.14	0.26	0.19	6.68	0.02	0.02	0.02	0.07
Maine[b]	0.55	0.20	0.20	6.52	0.35	0.08	0.04	0.12
Maryland[b]	1.18	0.37	0.52	0.45	0.33	0.14	0.17	0.35
Massachusetts[b]	1.91	1.94	0.39	2.90	0.78	0.41	0.02	0.36
Michigan	1.26	0.46	0.63	0.31	0.95	0.12	0.06	0.12
Minnesota[b]	0.76	0.08	1.30	0.24	0.10	0.06	0.04	0.08
Mississippi	0.52	0.00	0.12	0.32	0.00	0.08	0.00	0.00
Montana[b]	2.28	0.18	0.87	0.18	0.05	0.09	0.00	0.00
New Jersey	5.97	2.59	1.10	0.41	1.00	0.25	0.32	0.34
New York	8.12	3.19	0.80	0.94	0.78	0.73	0.15	0.58
North Carolina	0.97	0.07	0.29	0.51	0.03	0.08	0.05	0.12
Ohio	1.02	0.42	0.71	0.31	0.31	0.07	0.05	0.13
Oklahoma	1.04	0.06	0.36	0.26	0.03	0.16	0.00	0.13
Oregon	1.85	0.18	0.78	0.33	0.07	0.22	0.04	0.07
Pennsylvania	1.22	1.10	0.84	0.30	0.64	0.09	0.00	0.17
South Carolina	0.45	0.13	0.32	0.48	0.03	0.00	0.00	0.06
Tennessee	0.61	0.00	0.33	0.35	0.00	0.07	0.00	0.02
Texas	18.23	0.08	0.57	0.34	0.07	0.16	0.10	0.04
Utah-Nevada	2.90	0.14	0.68	0.50	0.05	0.05	0.27	0.05
Virginia	0.78	0.20	0.43	0.56	0.02	0.06	0.22	0.19
Washington	2.00	0.17	0.92	0.39	0.00	0.36	0.46	0.00
West Virginia	0.51	0.25	0.35	0.10	0.20	0.05	0.00	0.00
Wisconsin	1.37	0.38	1.50	0.11	0.80	0.04	0.04	0.00

[a] Defined for the population age 18 to 64 in each state or group of states.

[b] Maine includes Maine, New Hampshire and Vermont; Massachusetts includes Massachusetts and Rhode Island; Minnesota includes Minnesota, Iowa, Missouri, Kansas, Nekraska, South Dakota and North Dokata; Maryland includes Maryland and Delaware; Montana includes Montana-Idaho and Wyoming; Arizona includes Arizona and New Mexico.

Source: 1980 Census of Population, Public Use Sample, C sample, 1/1,000 sample of the population.

APPENDIX TABLE 4

PERCENTAGE REPRESENTATION OF MAJOR MINORITY LANGUAGE GROUPS BY REGION CANADA, 1981

	Language							
Region	**Chinese**	**German**	**Greek**	**Italian**	**Netherl.**	**Polish**	**Portug.**	**Ukrain.**
Newfoundland	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nova Scotia:								
Halifax	0.1	0.2	0.3	0.1	0.0	0.0	0.1	0.0
Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Brunswick	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Quebec:								
Quebec City	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Montreal	0.4	0.2	1.3	3.6	0.0	0.2	0.7	0.2
Other	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Ontario:								
Ottawa-Hull	0.7	0.3	0.1	1.3	0.1	0.2	0.4	0.1
Toronto	2.1	0.6	1.3	5.9	0.1	0.7	2.1	0.5
Hamilton	0.5	0.8	0.4	3.8	0.1	0.7	0.8	0.5
St.Catherines	0.2	0.8	0.2	3.5	0.2	0.8	0.0	0.6
Kitchner	0.5	2.8	0.3	0.4	0.2	0.3	3.0	0.2
London	0.6	0.3	0.8	1.2	0.1	0.2	1.0	0.2
Other	0.3	0.6	0.1	1.2	0.2	0.3	0.3	0.2
Manitoba:								
Winnipeg	0.7	1.4	0.2	0.6	0.1	0.5	0.9	1.4
Other	0.2	5.0	0.0	0.1	0.1	0.1	0.1	2.1
Saskatchewan	0.4	1.1	0.1	0.1	0.1	0.0	0.0	1.0
Alberta:								
Calgary	1.9	0.6	0.2	0.8	0.3	0.1	0.2	0.2
Edmonton	1.6	0.8	0.0	0.7	0.2	0.4	0.3	0.8
Other	0.3	1.3	0.0	0.1	0.2	0.1	0.0	0.7
British Columbia:								
Vancouver	4.5	0.9	0.3	0.9	0.2	0.1	0.4	0.1
Other	0.5	0.8	0.1	0.4	0.2	0.0	0.2	0.1
Pr. Edward Is.	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: 1981 Census of Canada, 1/50 Public Use Sample.

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